

Applying Advanced Asset Management Principles To Sustain Water Infrastructure.

USEPA
Advanced Asset Management

Steve Allbee
USEPA



This Presentation

- **An overview of trends and strategies in the provision of water and wastewater services.**
- **Establishing common quantitative understanding of the magnitude of required investment.**
- **Aging systems.**
- **A brief overview of USEPA Training on Advanced Asset Management.**
- **A strategic level glance at lessons learned in asset management processes, practices, tools and techniques.**
- **What's new!**

A Brief Overview of Water and Wastewater Infrastructure

Part of the fabric of modern living -- along with roads, transportation systems, energy and communications networks and other similar systems needed to deliver services

Water Related Infrastructure

- **Generally very large.**
- **The costs are usually “sunk”.**
- **Asset lives are long.**
- **The services are often major inputs into a wide range of other industries and activities.**
- **Frequently substantially impacted by other types of infrastructure decisions, especially choices about land use and the density of urban development.**

The Characteristics of Water Infrastructure Assets

- **The systems are maintained in perpetuity.**
- **Large networks are made up of components that are replaced, but network service potential remains constant.**
- **Don't actually (physically) depreciate on a straight line basis - that is, loss of service potential is not evenly distributed across time.**

The Financial Objectives Regarding Water Infrastructure

- **Investment adequate to replace the existing systems and acquire new service necessary to meet public health, environmental and service objectives.**
- **The most efficient and effective utilization of capital and non-capital spending.**
- **Systems where affordability does not impede achieving objectives.**
- **Systems that are sustainable.**

The Anticipated Performance Expectations

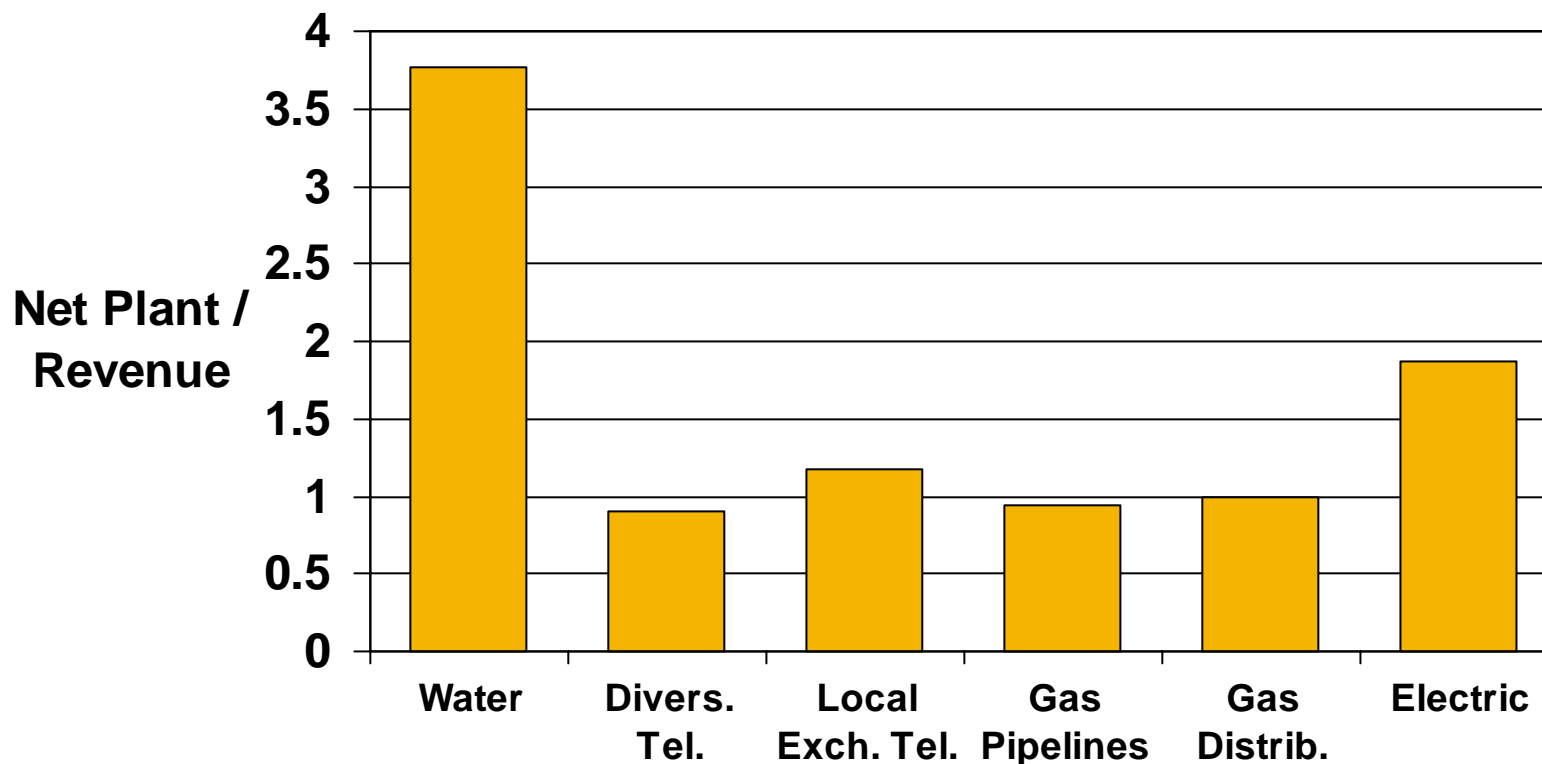
- **Meet level of service requirements.**
- **Reduce the impact (foot print) on the environment.**
- **Generate funds to build and rebuild systems.**
- **Efficiently use existing capacity.**
- **Promote efficient urban growth.**
- **Reflect optimal decision-making by adopting least life cycle costs approaches to meet current and future service requirements.**
- **User pay principles, but keep charges affordable.**

We Have Highly Decentralize Management Of Water / Wastewater Assets

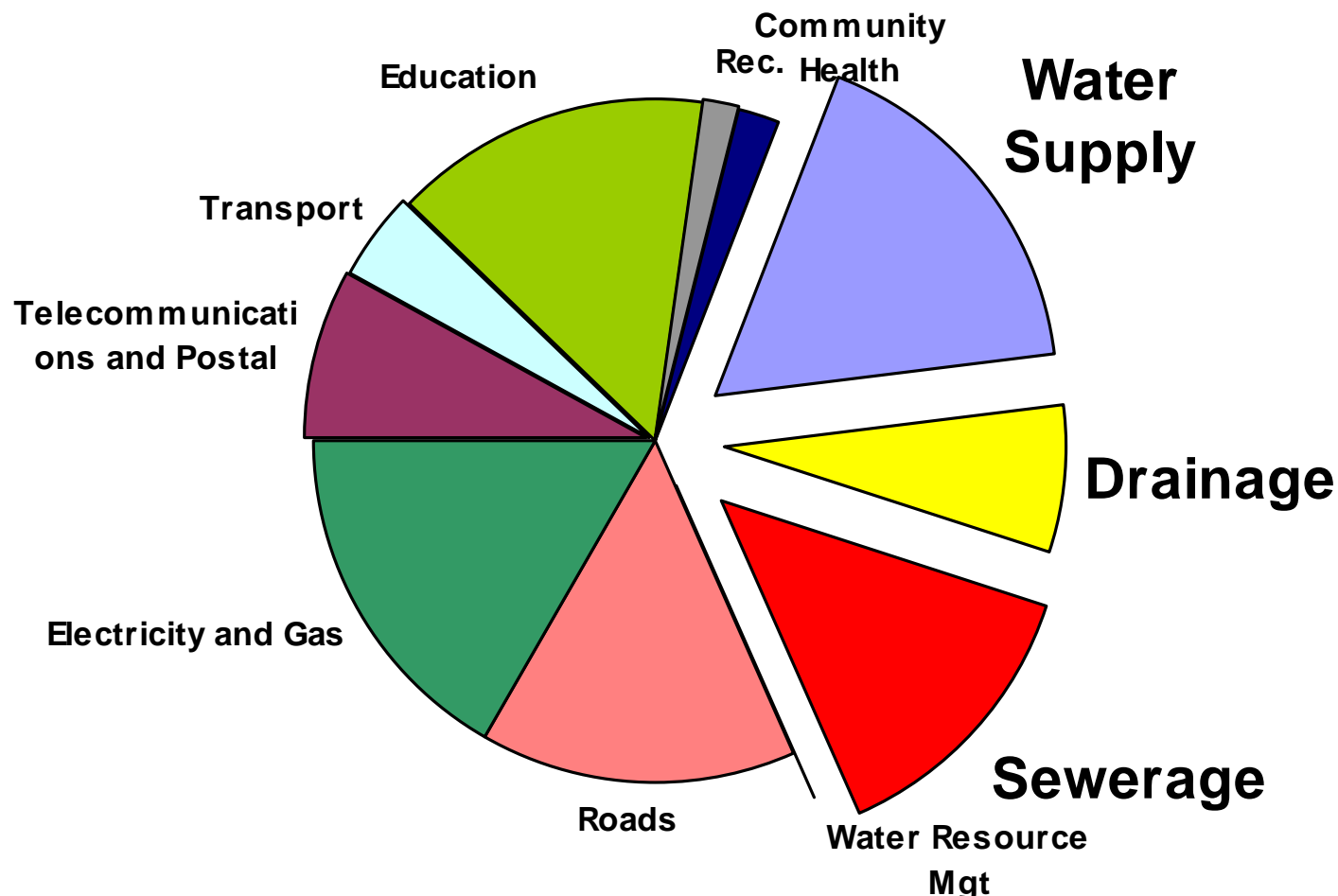


- There are 16,000 public owned wastewater systems serving 75% of the population through centralized systems
- There are 54,000 community based water systems serving about 94% of the population through centralized systems
- The remainder of the population is served by on-site systems and private wells
- Most of the systems are small or very small
- However, most of the population is served by a relatively few large systems

Water and Wastewater Systems Are Highly Capital Intensive - - The Networks (distribution and collection) Are Costly - -

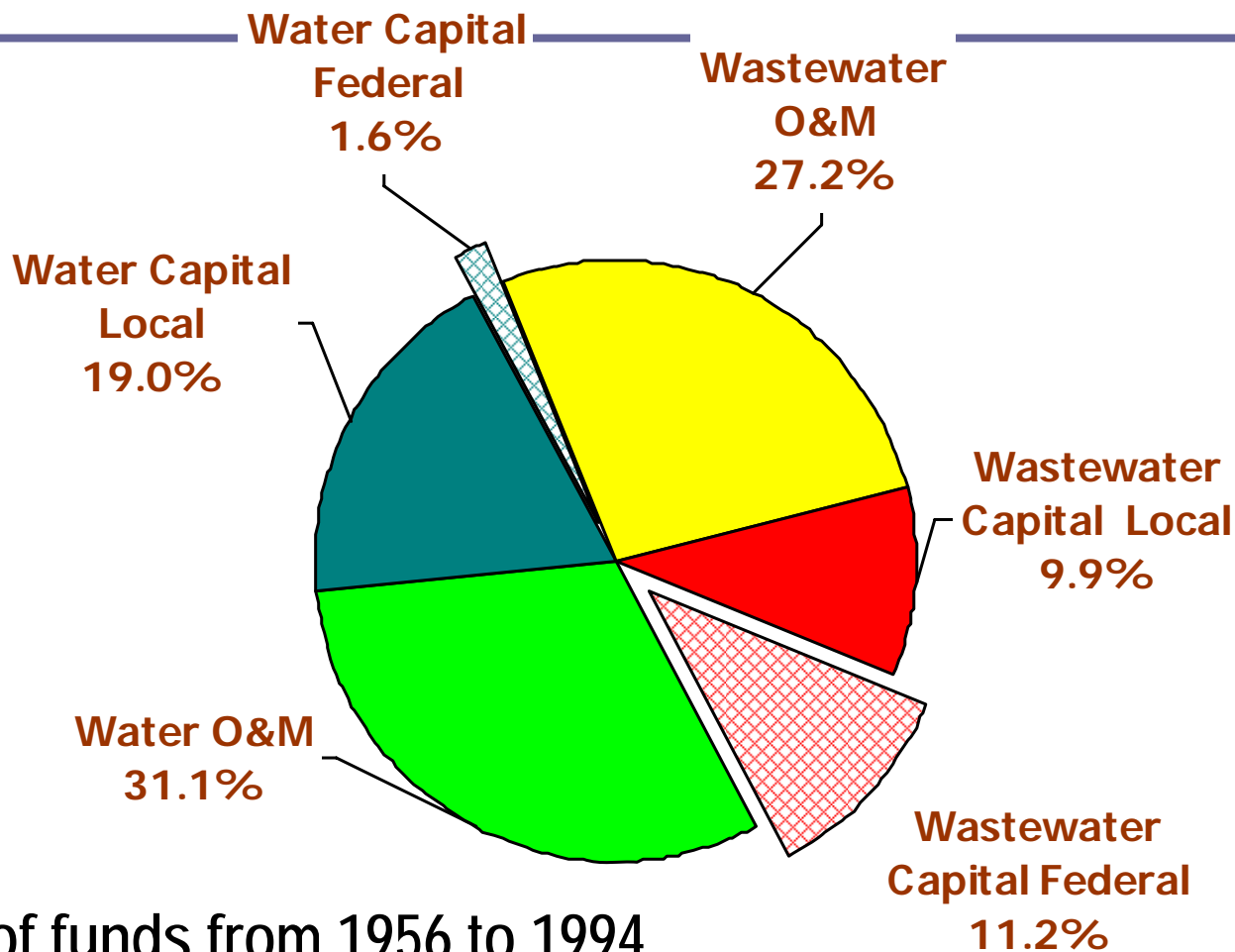


Water, Sewerage and Drainage (30 to 35%) of All Capital Investment in Infrastructure Associated With An Urban Lot



An Australian study on the relative capital costs of all forms of infrastructure investment to serve a typical lot in Melbourne.

The Vast Majority of the Resources Comes From Local Sources



Sources of funds from 1956 to 1994

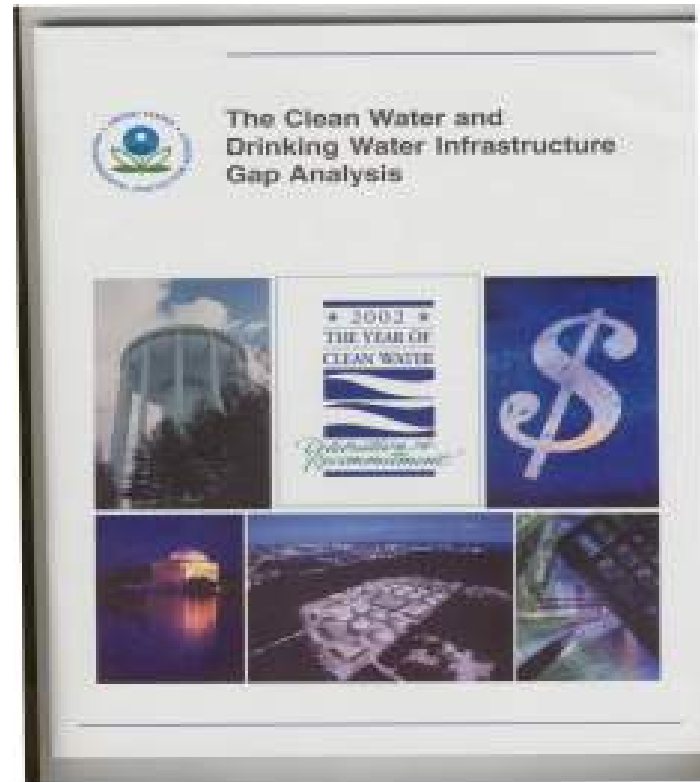
The USEPA Undertook A Gap Analysis To Establish a Common Understanding of The Challenges Ahead

The Understanding:

- Does not predict fate - - it identifies the challenge.
- Once it is determined where you are, you can do something about getting somewhere else.
- Identifying the elements of the challenge allows resources to be used where it counts most.
- Early understanding provides time to take steps to mitigate adverse outcomes and reach consensus on a pathway forward.

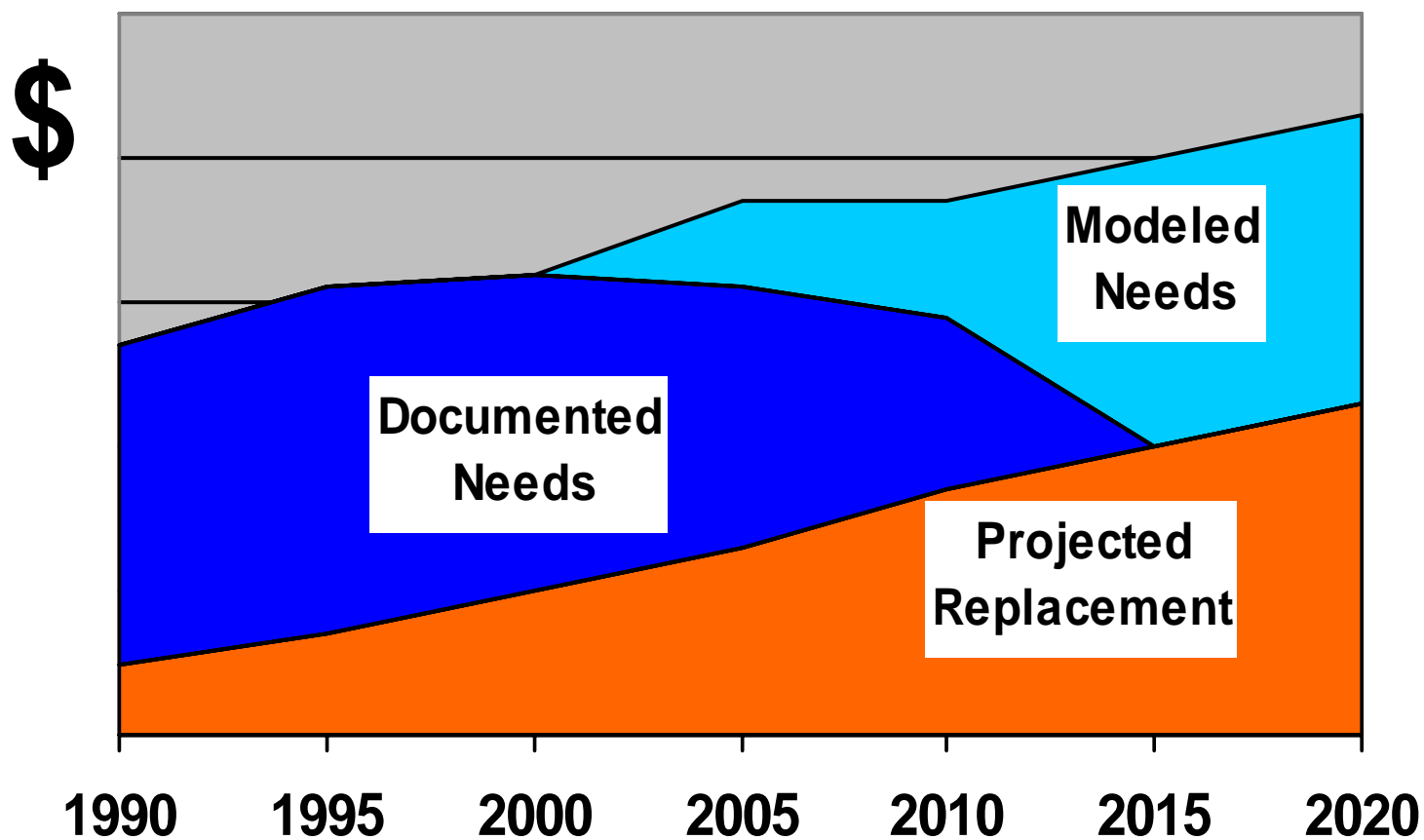
The Gap Report Is Intended to Provide - - A Transparent Starting Point - - The Gap Report Was Released - - WEFTEC 2002

- **Purpose -- To reach a common quantitative understanding of the potential magnitude of investment needed to:**
 - **Address growing population and economic needs, and**
 - **Renew our existing aging infrastructure.**
- **The data is comparable, at order of magnitude level, with WIN & CBO reports.**



<http://www.epa.gov/owm/gapreport.pdf>

The Source of Estimates



The Findings (2000-2019)

No Revenue Growth Scenario

Total Payment Gap (20 Years) (Average in Billions of Dollars)		
	Clean Water	Drinking Water
Capital	\$122	\$102
O&M	\$148	\$161
Total	\$271	\$263

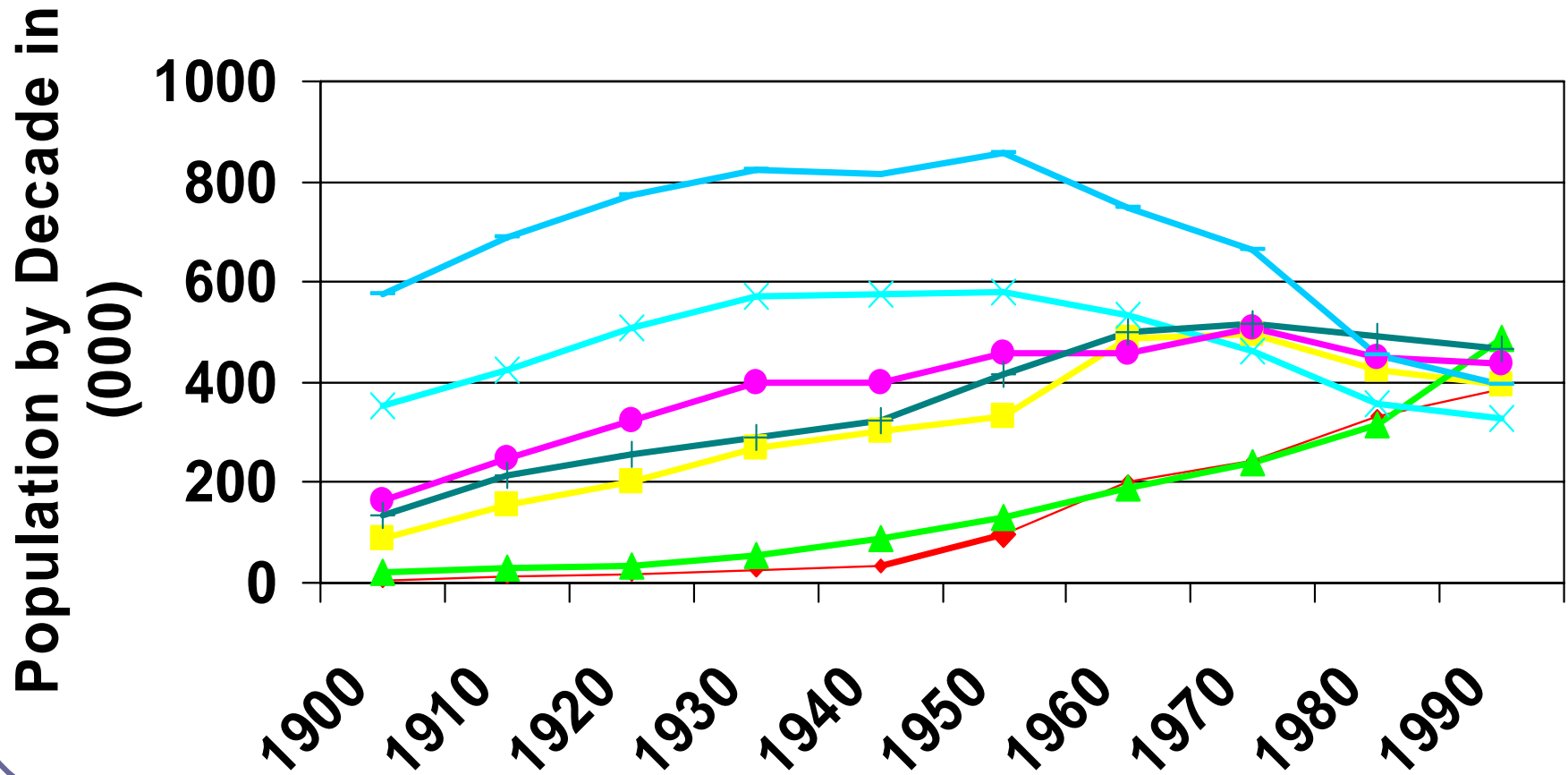
Revenue Growth Scenario

Total Payment Gap (20 Years) (Average in Billions of Dollars)		
	Clean Water	Drinking Water
Capital	\$21	\$45
O&M	\$10	\$0
Total	\$31	\$45

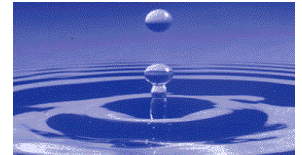
(Annual Rate of Increase - 3% Real)

The Estimates Represent National Aggregate Numbers-
The Projection Techniques Cannot Be Rationally
Disaggregated To Apply To A Specific Area.

Seven Metropolitan Regions That Currently Have Similiar Service Populations



There Are Other Reports That Suggest
Growing Awareness Concerning The
Challenge of Aging Infrastructure From
Multiple Viewpoints



**THE U.S. CONFERENCE OF MAYORS
URBAN WATER COUNCIL**
The National City Water Survey 2005

The *NATIONAL CITY WATER SURVEY* was distributed to nearly 1,200 cities with mayoral forms of government (Populations of 30,000 or greater). Nearly 35 percent of the principal cities (414 cities) responded to the survey



At the top of the priorities identified, a combination of chronic "every-day" problems associated with maintaining and rehabilitating aging water and wastewater infrastructure

NATIONAL CITY WATER SURVEY 2005

Sort by Population Size	% of Cities
Smaller Cities Less Than 50,000	41
Medium Cities 50,000 to 100,000	34
Large Cities Greater Than 100,000	25

The Respondents Were Relatively Large Cities

Rank Order	Water Resources Issue National City Water Survey 2005	Percent Of Cities
1	Aging Water Infrastructure	60.6
2	Security/Protection of Water Infrastructure	54.6
3	Water Supply Availability	46.4
4	Permits, Regulatory Issues	45.2
5	Water Quality/Urban Streams-Rivers	42.3
6	Flooding	38.4
7	Emergency Planning and Management: storms, hurricanes	34.3
8	Drought Management	32.6
9	Regional Conflict Over Water Use	26.8
10	Water Rights	25.1

NATIONAL CITY WATER SURVEY 2005

*Actual Investment

** Planned Investment

	2000 –	2005 –
Infrastructure	2004* (% of cities)	2009** (% of cities)
Water Supply	61.5	59.3
Water Treatment Plant	56.5	49.6
Water Distribution System	83.7	79.0
Wastewater Treatment Plant	55.5	52.8
Wastewater Collection System	72.2	69.8

What Drives The Numbers?

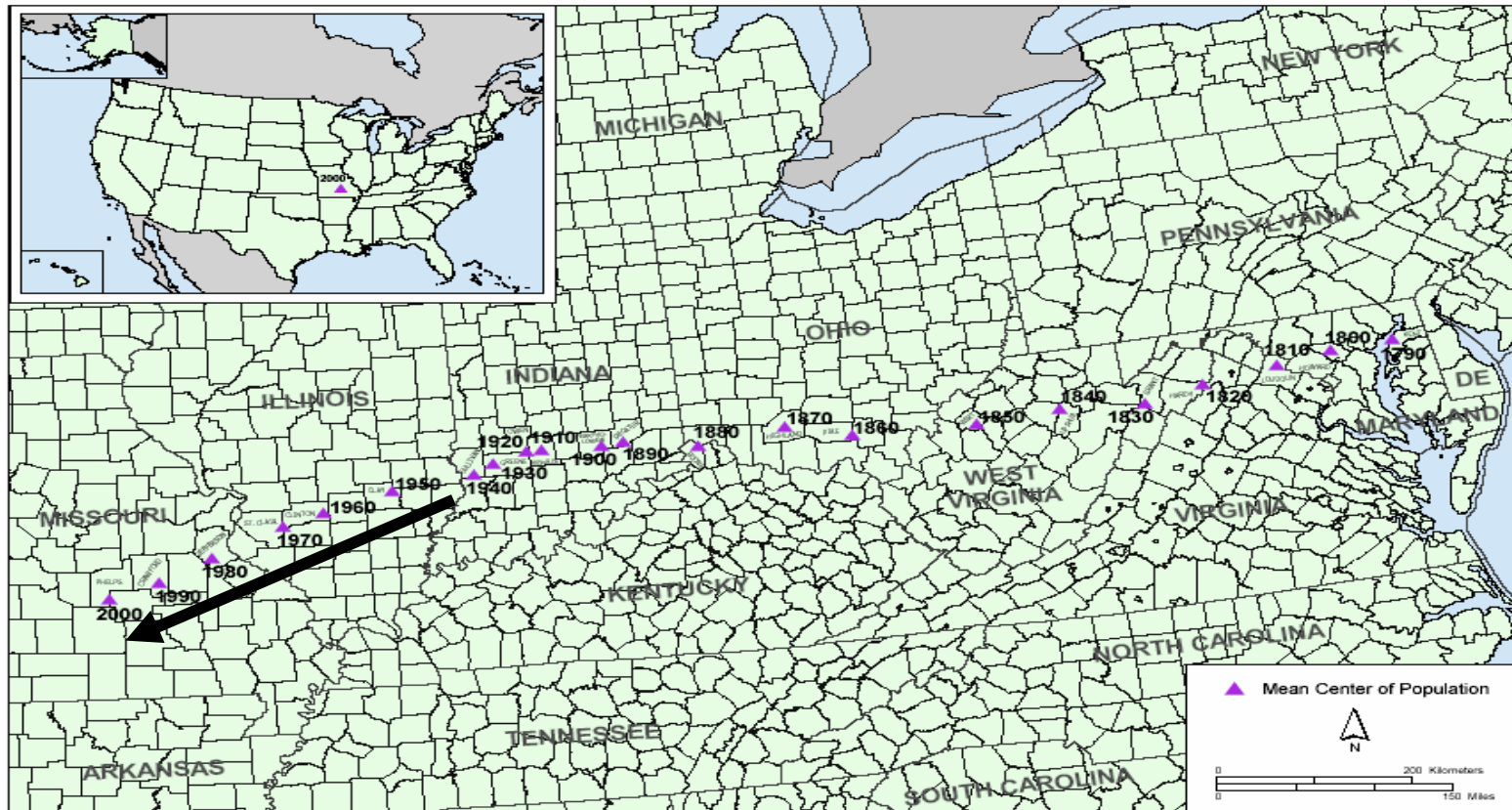
- Another round of new investments to deal with a growing population & economy.
- For the first time, substantially adjusting financial approaches, to meet increasing demands for maintenance, repair, renewal and replacement associated with aging systems.

Key Demographic Changes Provide the Backdrop To Understanding The Challenges

Long Life Assets (Water
Infrastructure) Are Highly Impacted
By Growth Patterns and Long Term
Demographic Shifts.

Over The Past Century the Population Increased and The Population Centers Shifted Toward the West and South

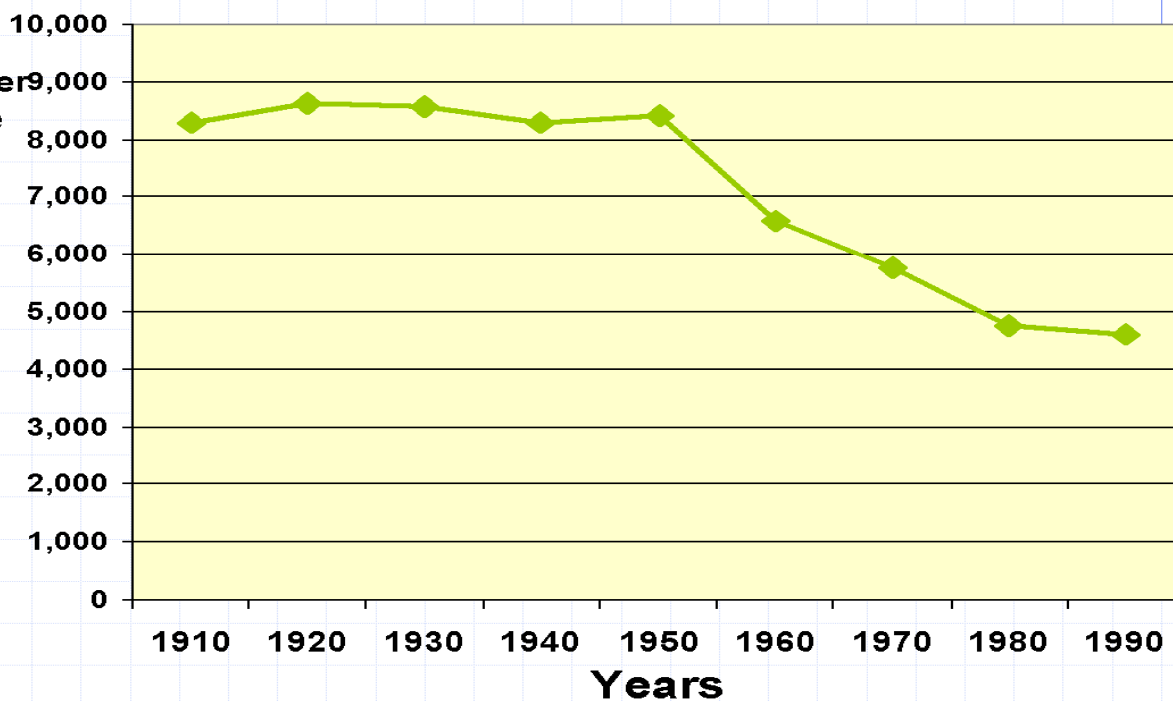
Mean Center of Population for the United States: 1790 to 2000



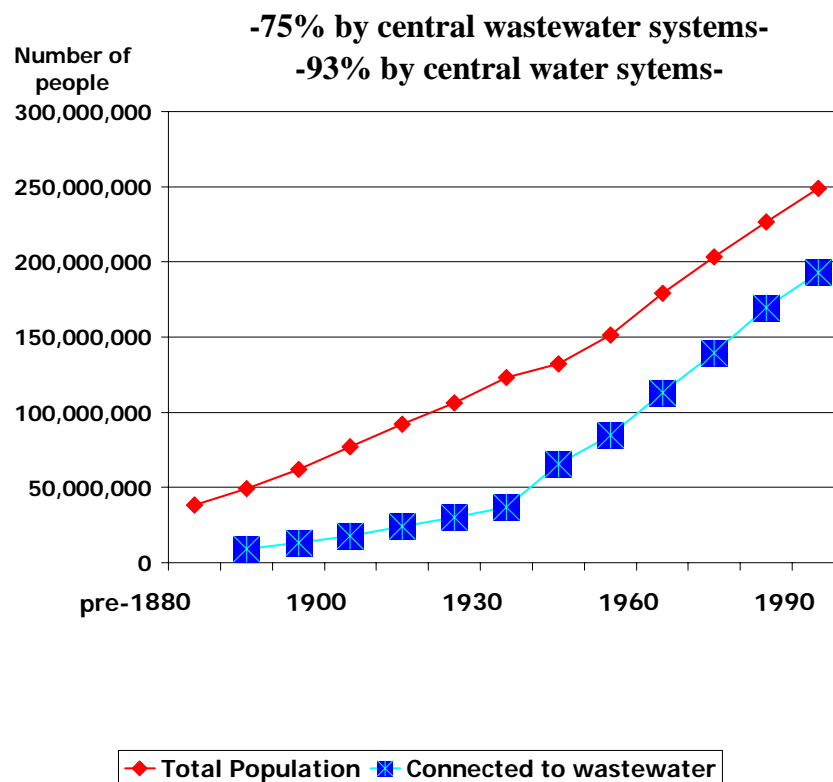
The Density of Our Urban Areas Has Declined

**The average density of the urban population
started a dramatic decline after 1950
(The 100 largest cities)**

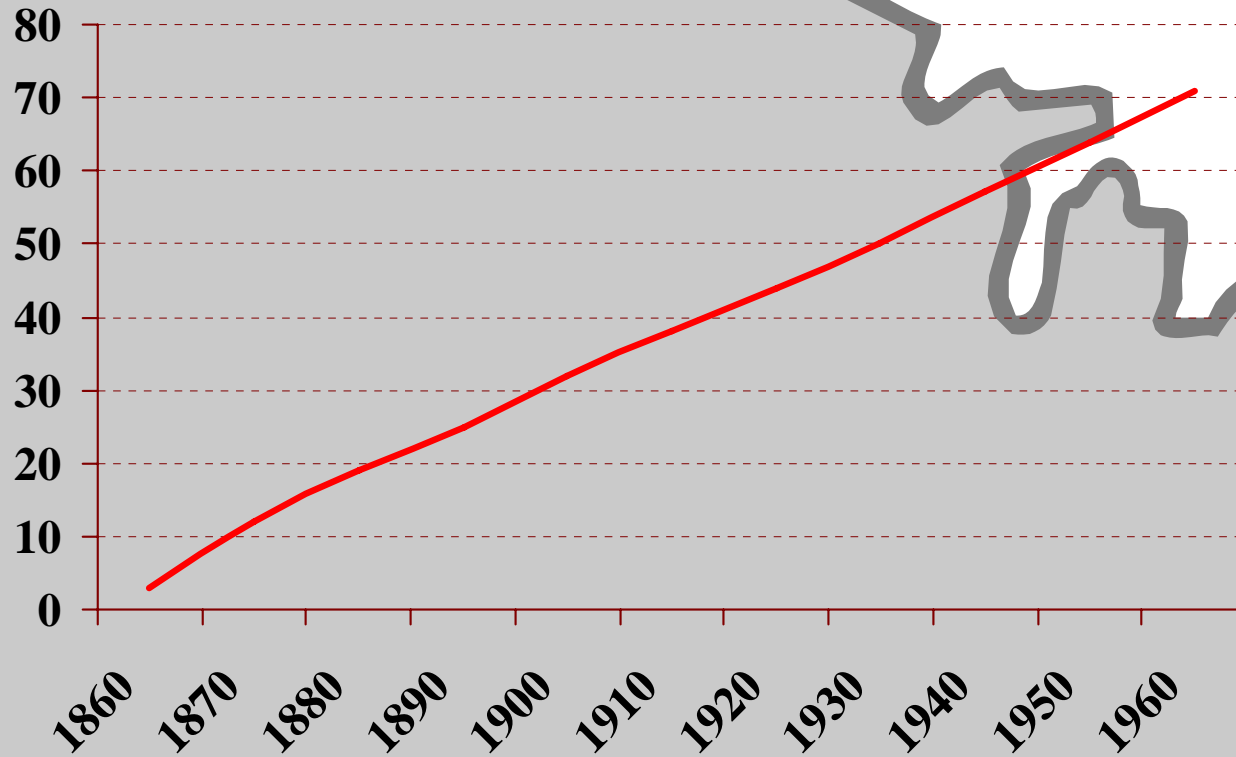
Average
population per
square mile



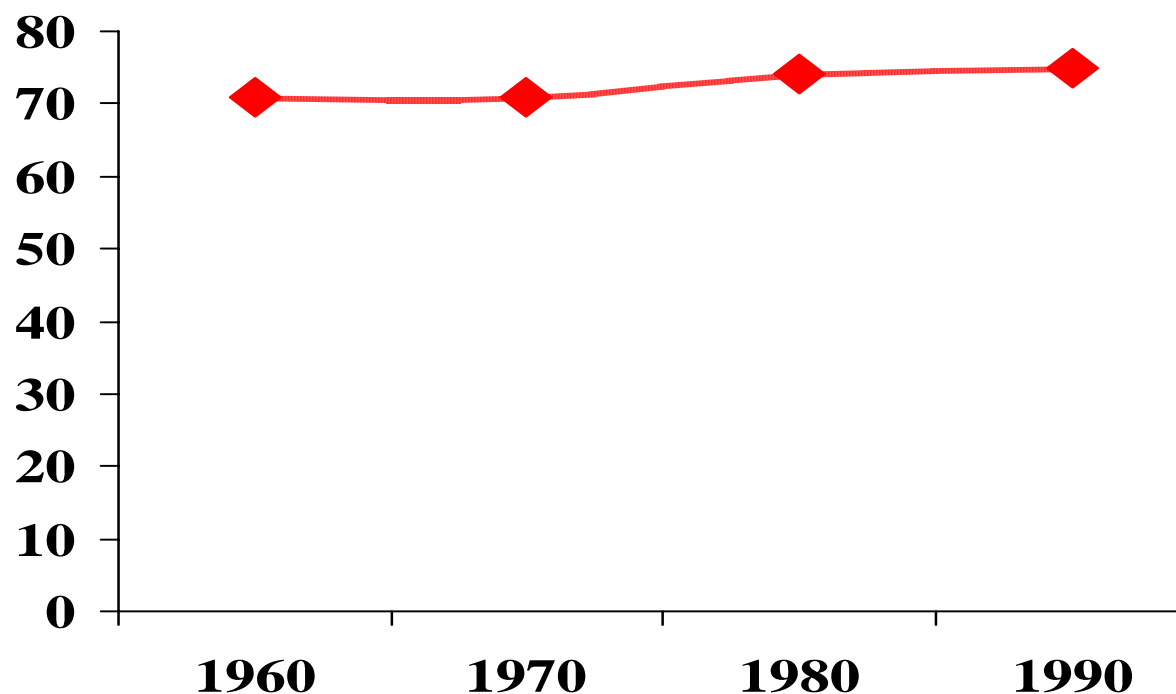
The Population Served By Centralized Systems Increased



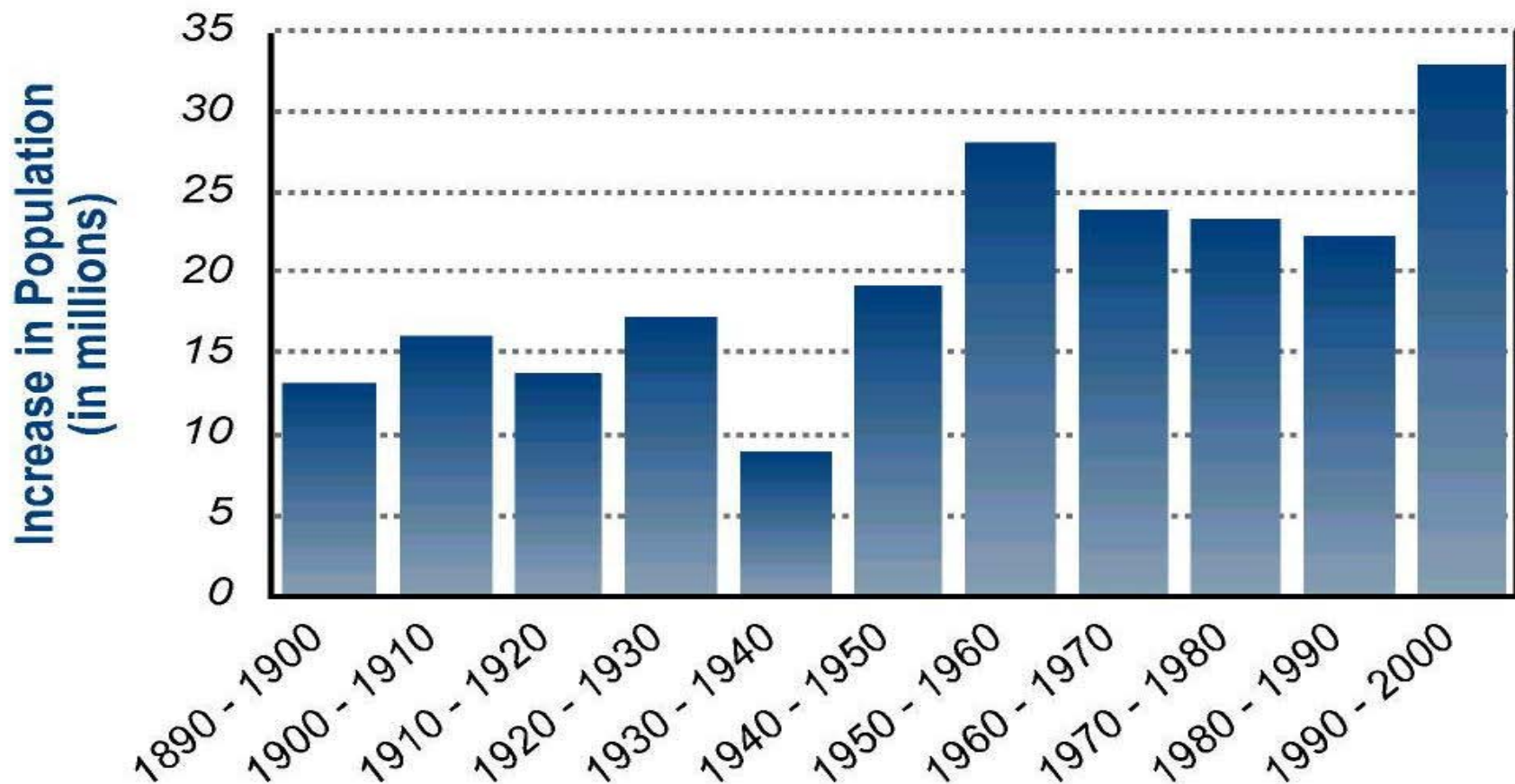
Percent of U.S. Population on Public Sewer



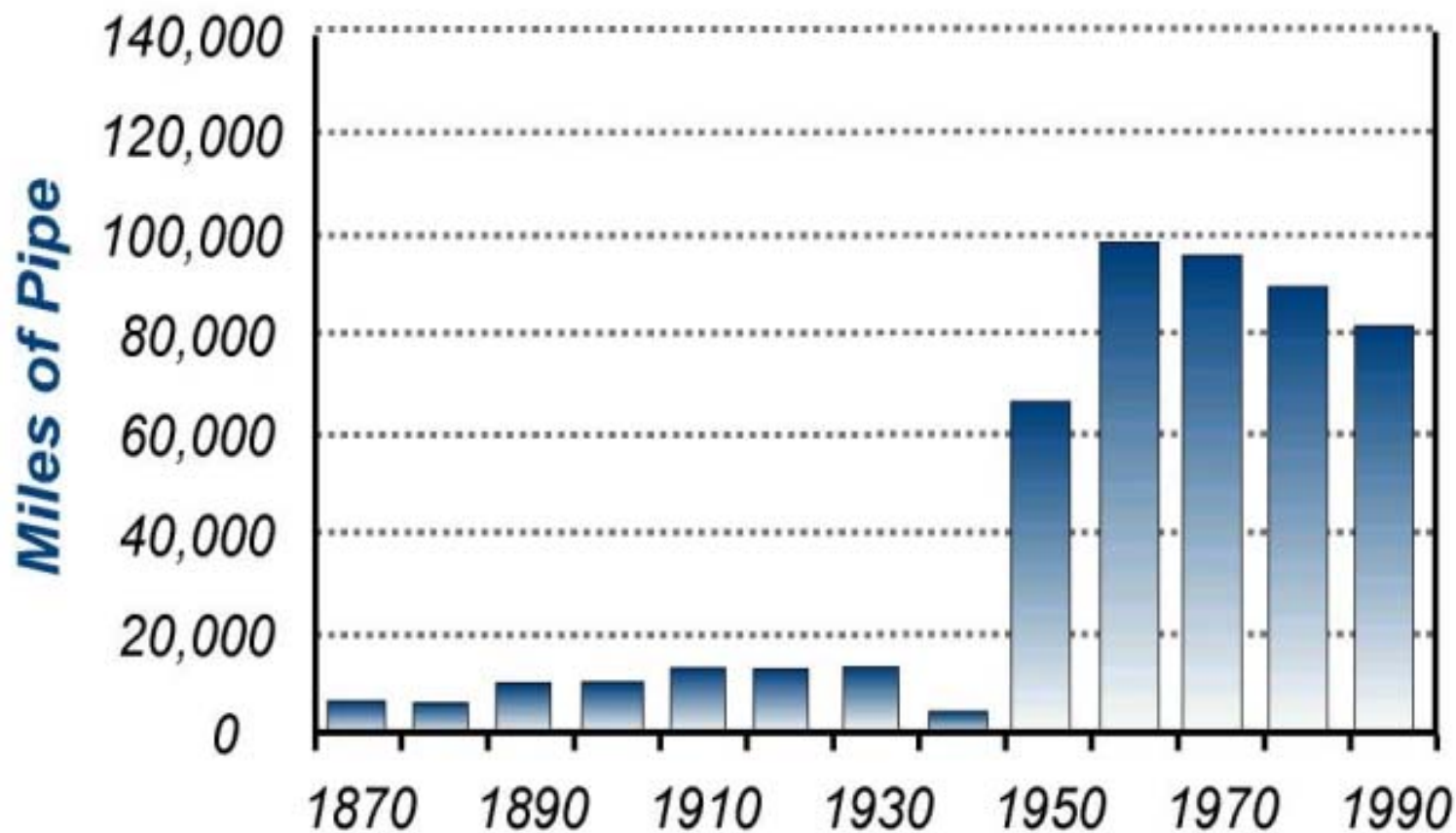
Since the 1960s, The Percentage of the Population Being Served By Centralized Sewer Systems Has Leveled



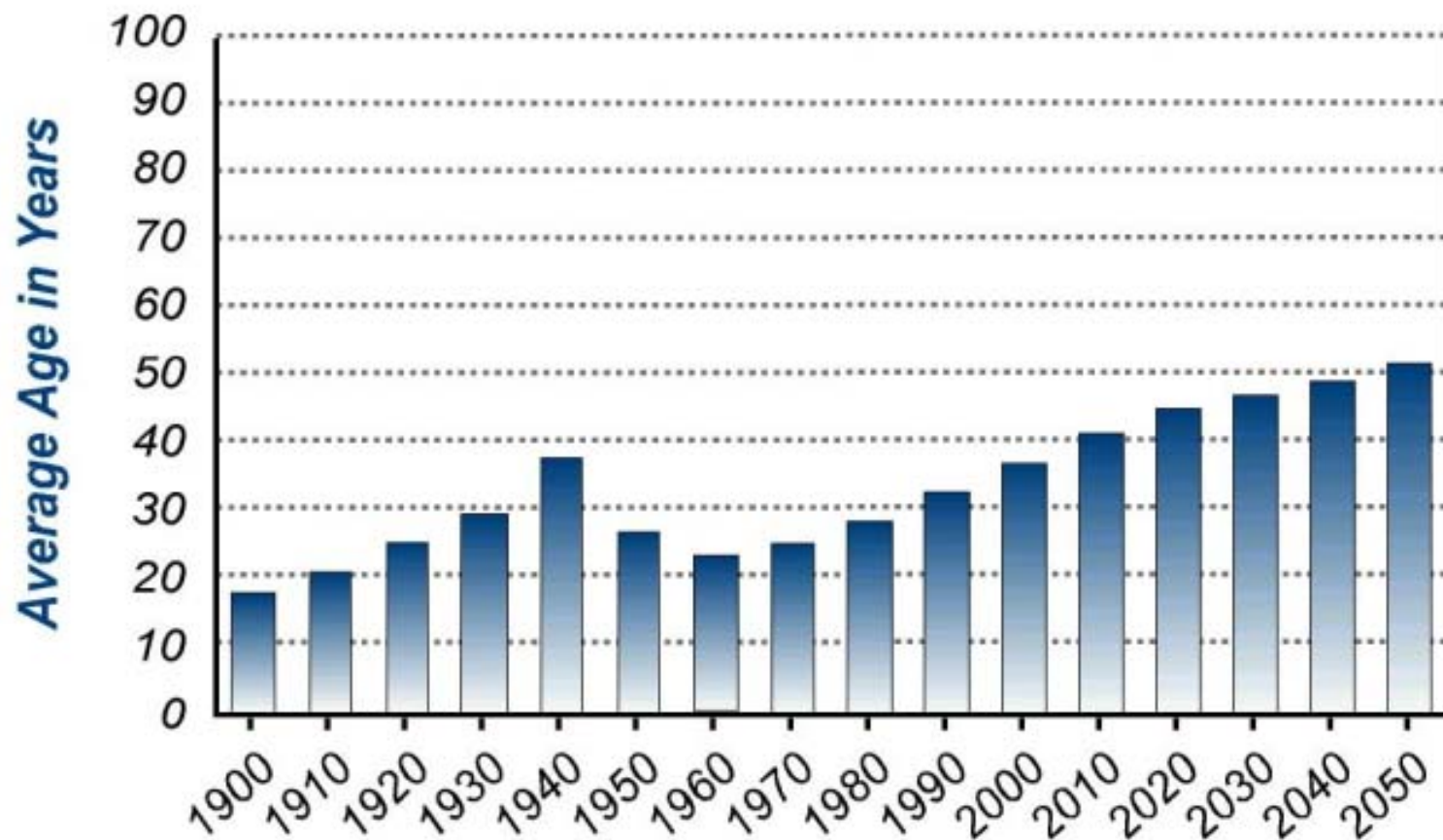
Yet, the U.S. Added Over 30 Million People
Between 1990 and 2000 - - the Results Is Growth Continues In
the Number of People Served By Centralized Systems



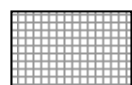
The Vast Majority of the Pipe Networks for Distribution and Collection Have Been Built Since The End of World War II



The Challenge of Dealing With The Aging of These Networks Will Be A Generational Issue For Years To Come



More Pipe in Lower Condition Levels Will Impact Costs and Performance



Excellent



Good



Fair



Poor

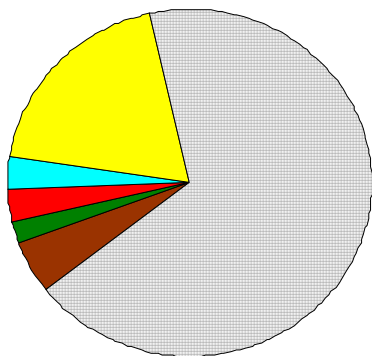


Very Poor

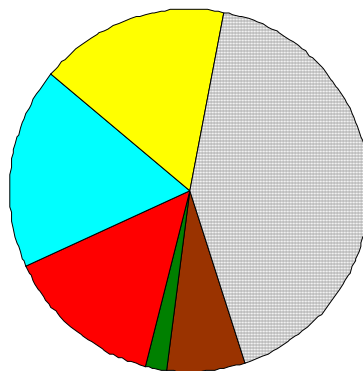


Life Elapsed

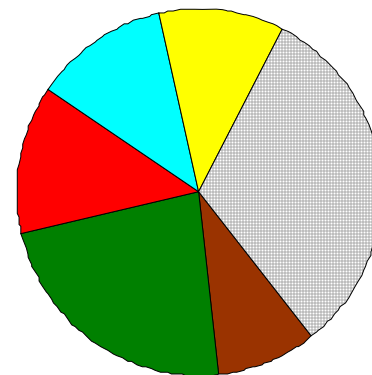
1980



2000

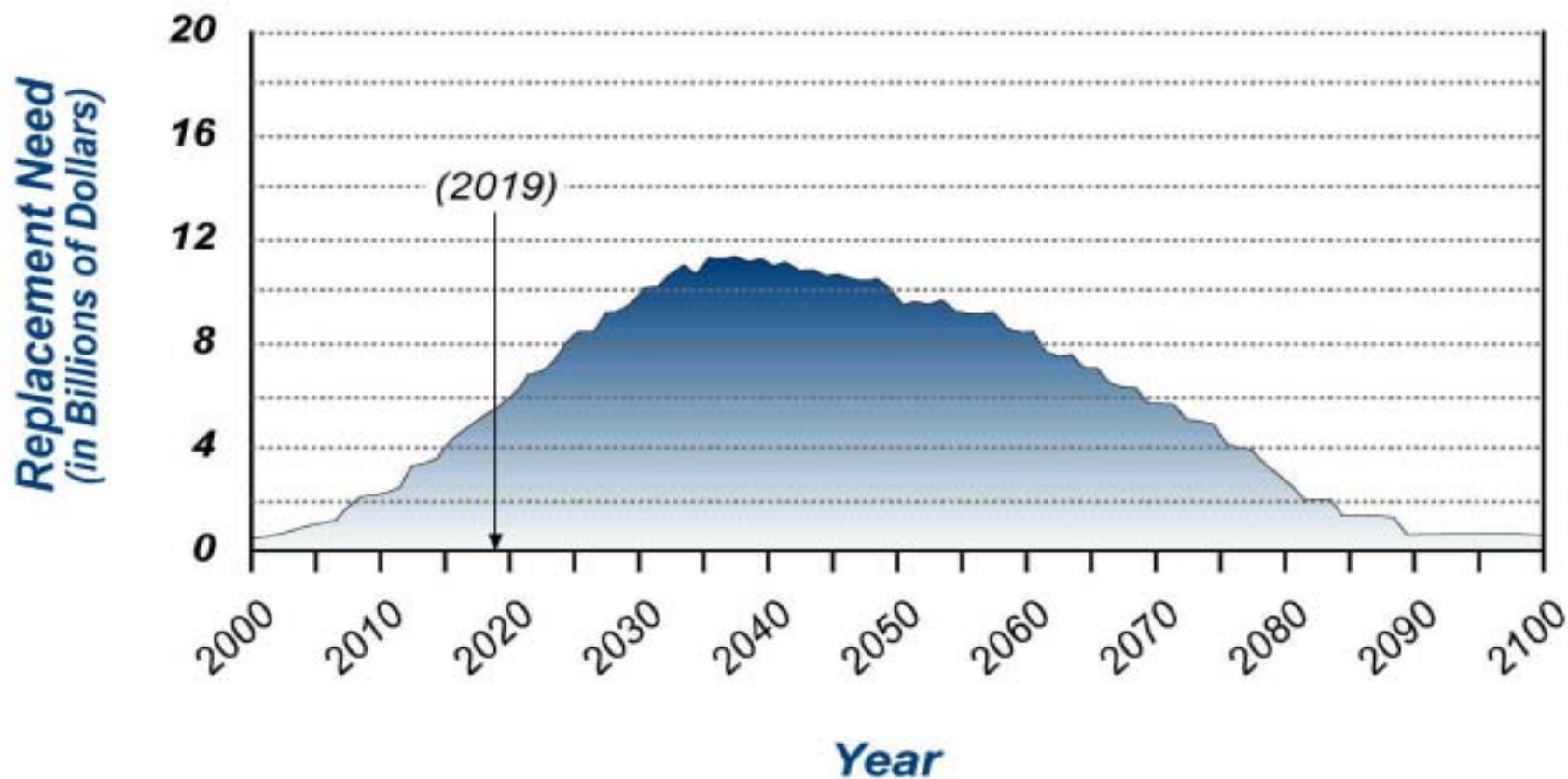


2020



Approximately 2 - 2.5 Million Miles Water /
Wastewater: Public / Private

The Challenge Peaks After "2000 - 2019"



This Is Not A " All Broke Crisis" But, on the Way to a Systemic Problem

- Our systems are aging.
- The status quo will result in increased public health and environment risk.
- Failure to manage the assets based on life cycle costs will require more revenues over the long term to meet service objectives.

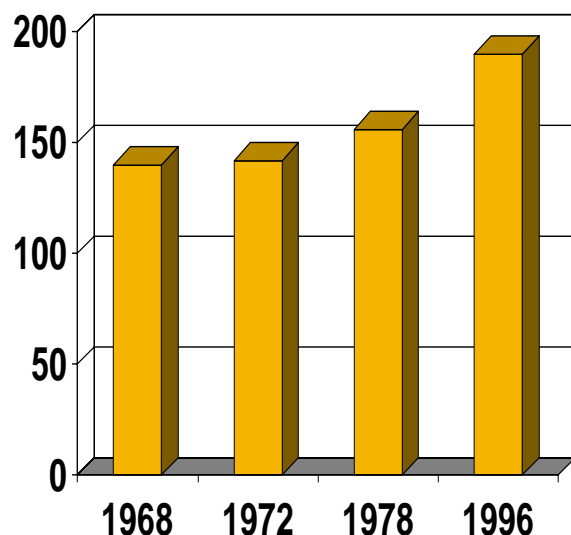


The Recent Focus On Upgrading Service Also Plays An Important Role In Identifying the Dimensions of The Challenges, Ahead

- In the 1970s, The Country Faced Significant Water Quality Problems and Major Policy Changes Were Undertaken.
- The Federal government took on a larger role as a regulator and became a very significant source of funds for capital improvements.
- A new permit process was established to control discharges to the nation's waterways.
- Very large investments were made in the treatment of industrial waste and in the upgrading of the public wastewater systems.

Over The Last Several Decades the Public Investment Has Been Toward Upgrading Service Levels

50 Million More Served

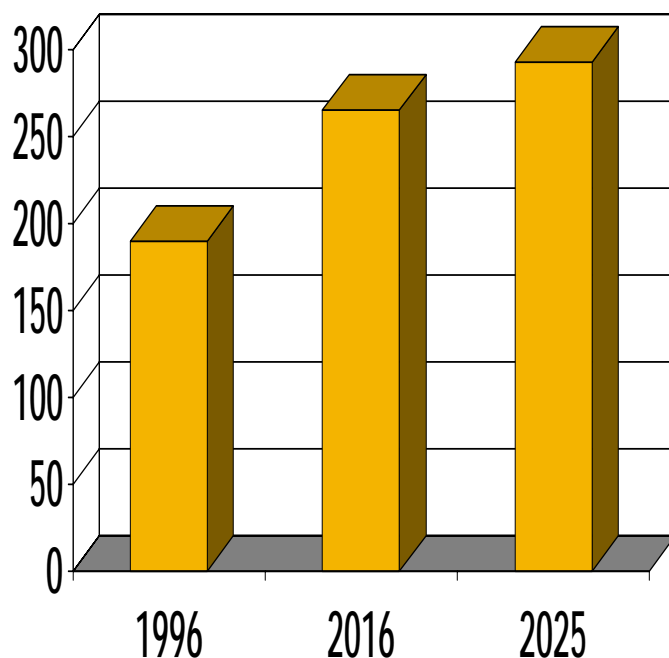


<u>Higher levels of treatment</u>				
	72	82	92	96
Total Plants	19,355	15,662	15,613	16,024
Less Than Secondary	13.4%	19.9%	5.6%	1.1%
Secondary	48.7%	50.7%	58.2%	58.6%
More Than Secondary	2.4%	17.6%	23.6%	27.6%
No Discharge	2.4%	10.2%	12.7%	12.7%

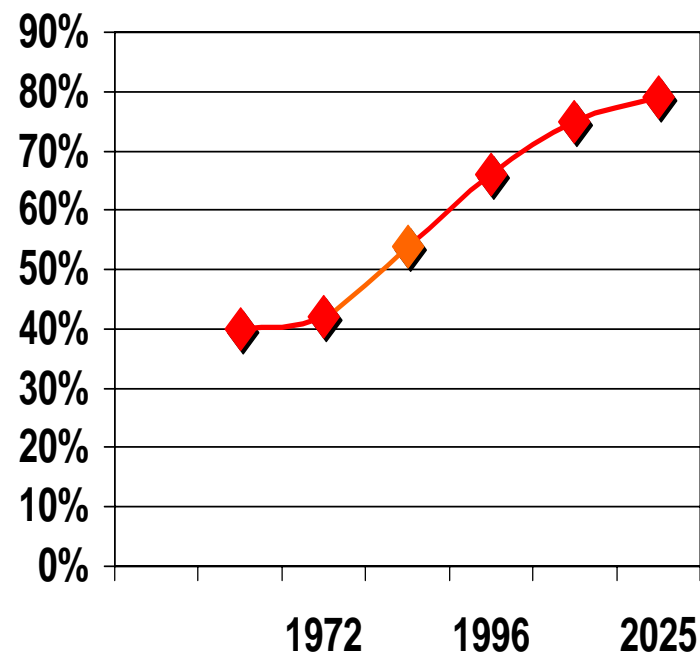
Source: USEPA, Progress in Water Quality. An Evaluation of the National Investment in Municipal Wastewater Treatment, June 2000.

The Emerging Challenge

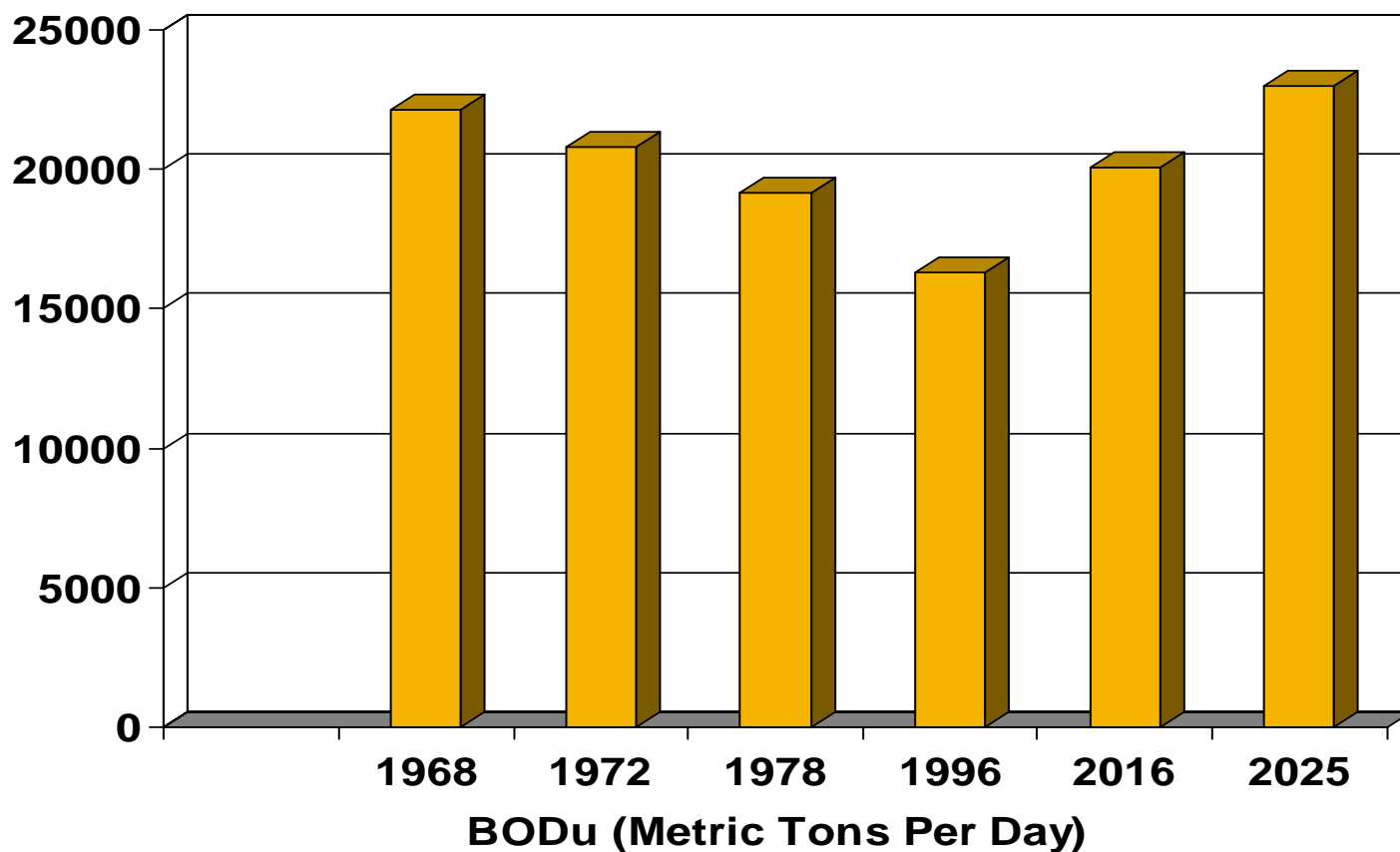
**Additional Served
Population 1996 to 2025
(In Millions)**



**Leveling Off of BOD_U
Removal Efficiencies**



The Additional Growth, Could Produce by 2016, BOD_u Loadings to the Waters Similar to the Mid-1970s



Source: USEPA, Progress in Water Quality: An Evaluation of the National Investment in Municipal Wastewater Treatment, June 2000.

Placing an Emphasis on Tackling the Problems Produced Results, However !

- **Infrastructure challenges are not addressed through a one time fix, but rather a sustained commitment.**
- **The emerging focus is on taking the steps necessary to retain the gains achieved from the major investment of the last thirty years.**
- **The largest change in meeting the emerging challenge is that for the first time, in addition to making new investments, renewal and replacement of existing systems.**

Change Goes Beyond Additional Dollars

- Reduce the rate of increase in cost.
- Innovation and new technology
- Sustainable approaches
 - adoption of best management practices,
 - right sizing of service delivery,
 - asset management approaches,
 - environmental management systems,
 - Smart and efficient water use.
- Integrated system wide thinking on reliable onsite.
- Watershed-based decision making.
- Public participation and transparency in decision making.

As We Look To the Future, One Thing That Is
Unquestionably Critical To Sustainability!

**That Utilities Are Able to Do Their Work Expertly
On Into The Future**



EPA Has An Agenda That is Designed to Support The Pursuit of Sustainability

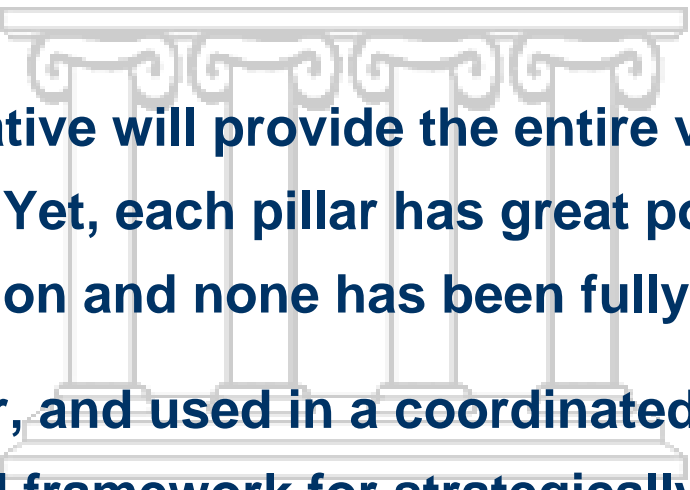
● SRF Plus

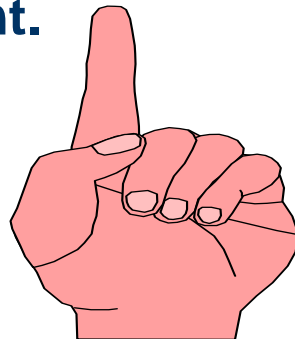


- ✓ Better management
- ✓ Water efficiency
- ✓ Full cost pricing
- ✓ Watershed approach



Local Governments As the Owners of Systems Are The Focal Point In Fostering Sustainable Infrastructure

- 
- A faint, light gray illustration of a classical building with four prominent pillars is centered in the background of the slide.
- **No single initiative will provide the entire venue for sustainable infrastructure. Yet, each pillar has great potential to contribute toward a solution and none has been fully exploited.**
 - **Taken together, and used in a coordinated fashion the pillars offer a focused framework for strategically moving toward a sustainable arrangement.**

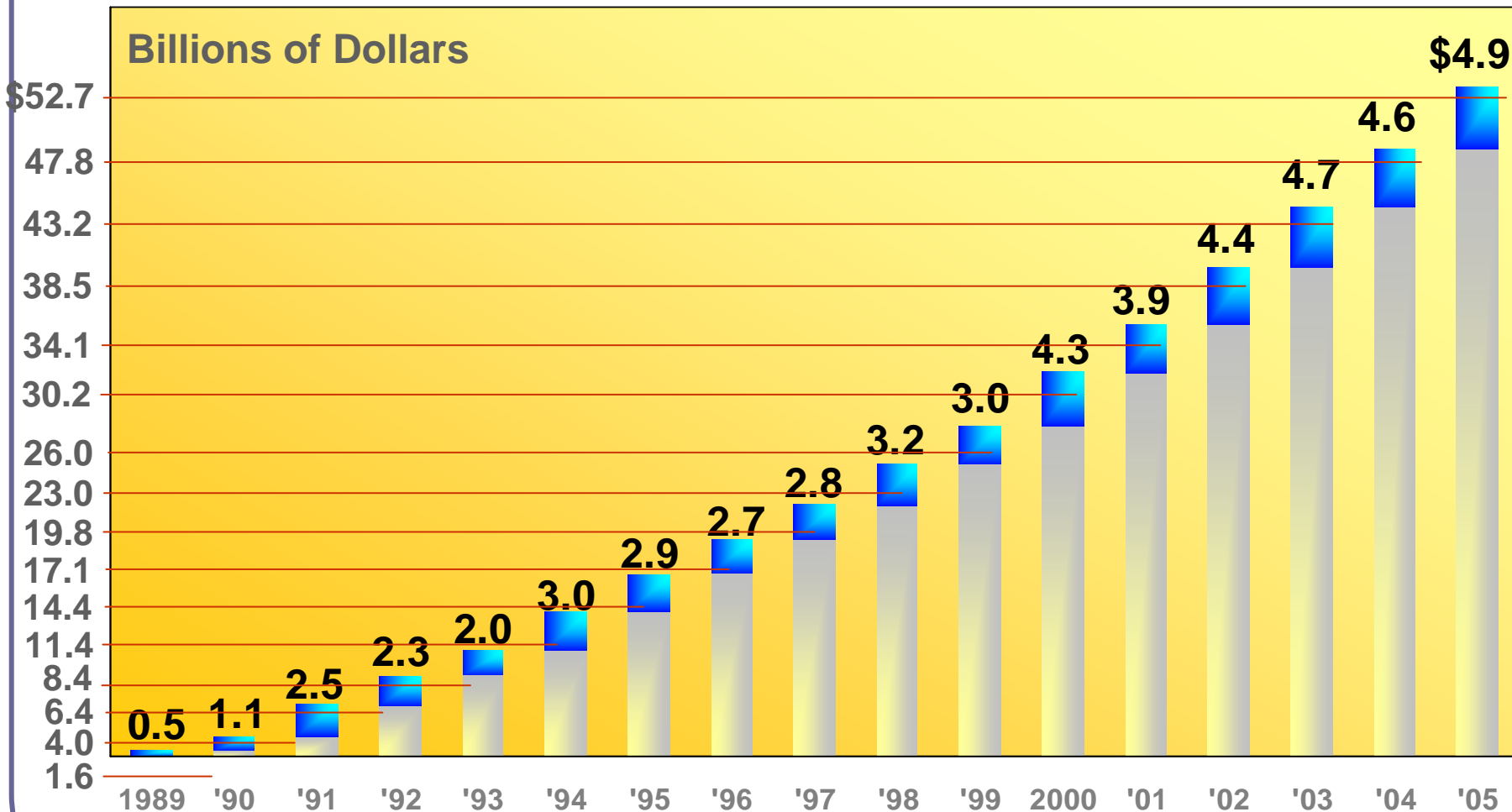


The State Revolving Fund Program

**A Record
of
Success**



CWSRF Cumulative Assistance Exceeds \$52.7 Billion

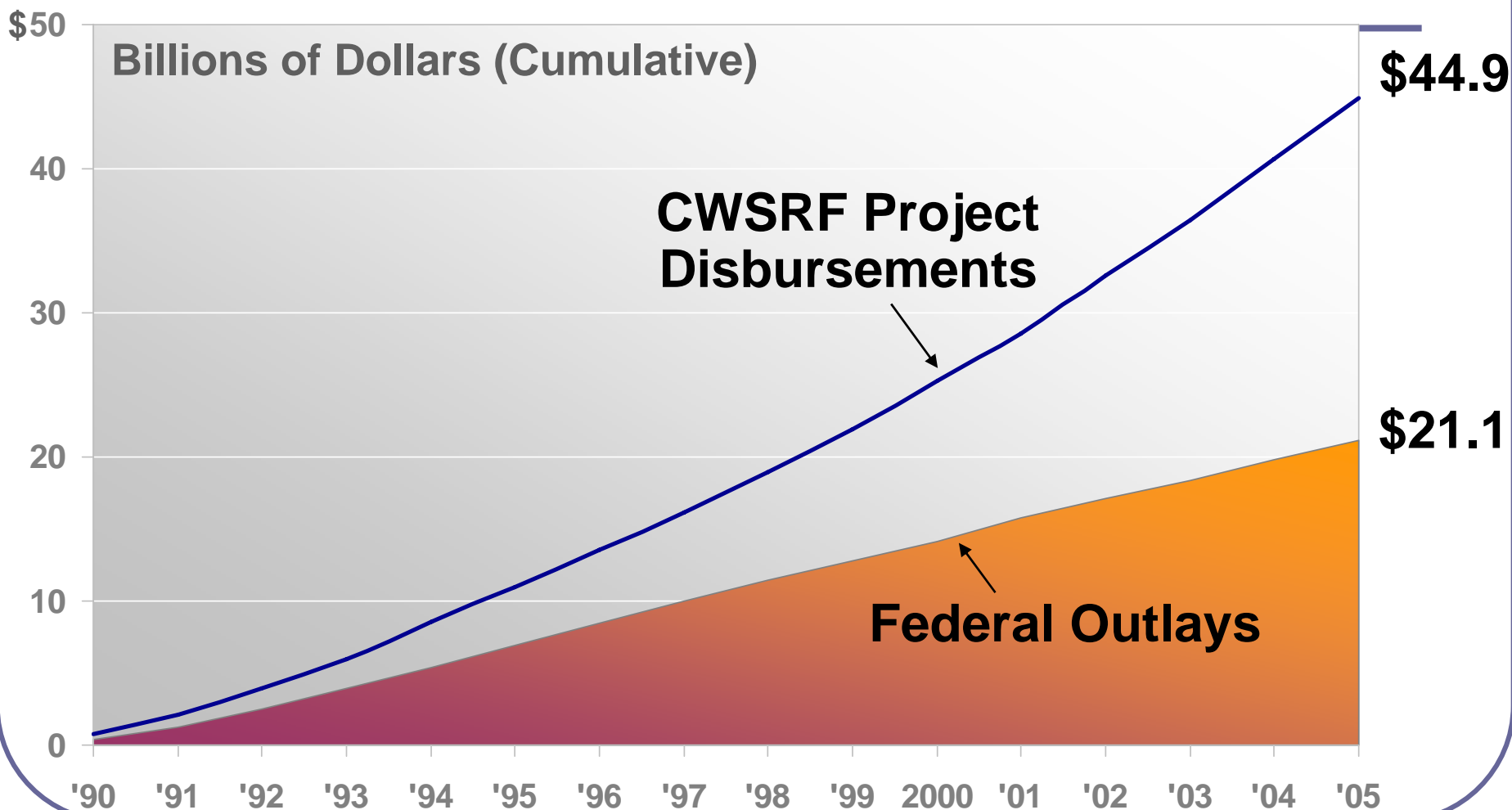


Annual Number of Loans Averages 1,400
Cumulative Number of Loans Exceeds 16,700

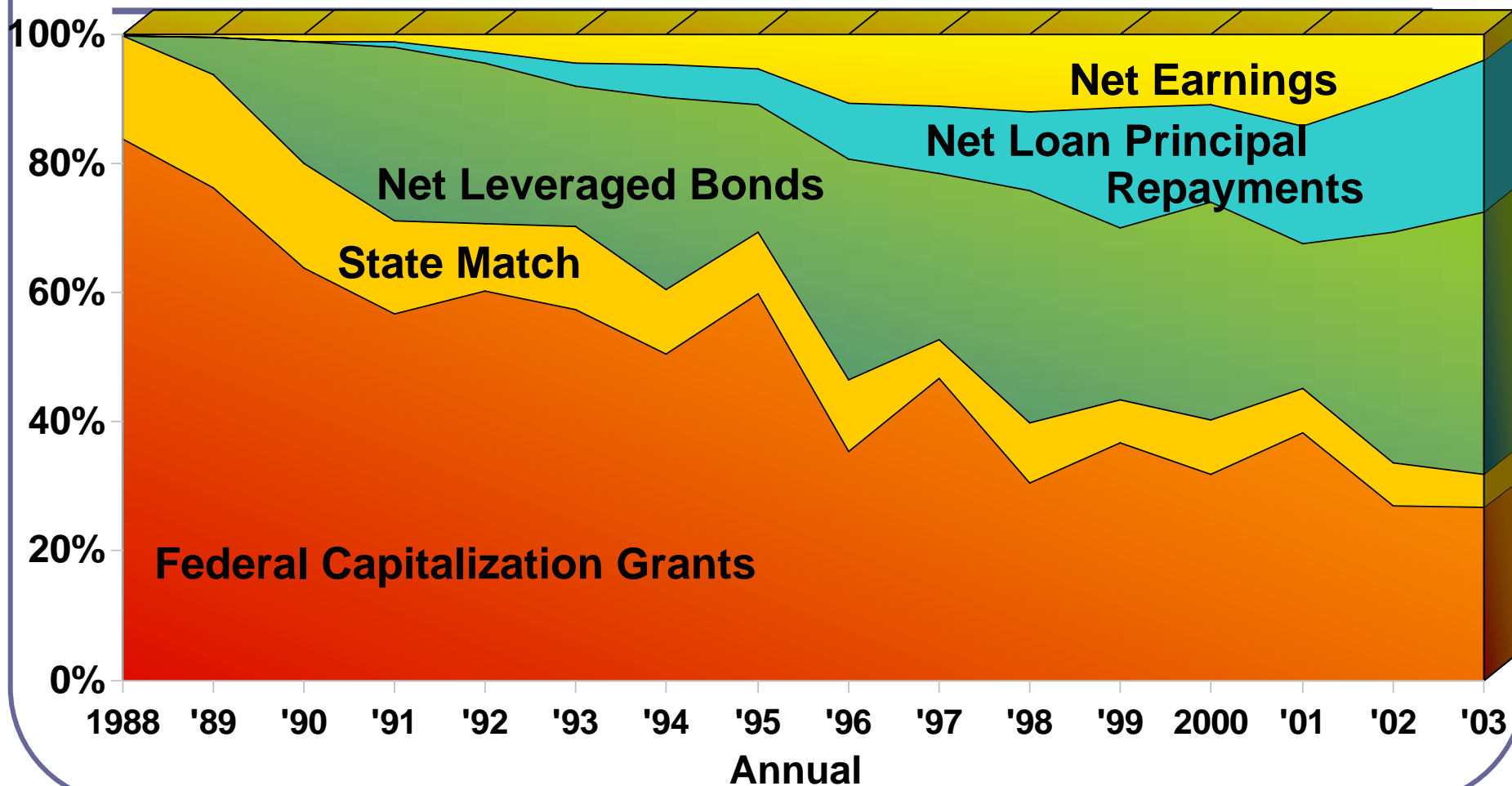
Annual

Cumulative

CWSRFs Return 2.12 Times the Federal Investment



The Relative Share of Sources of Funds Continues to Shift



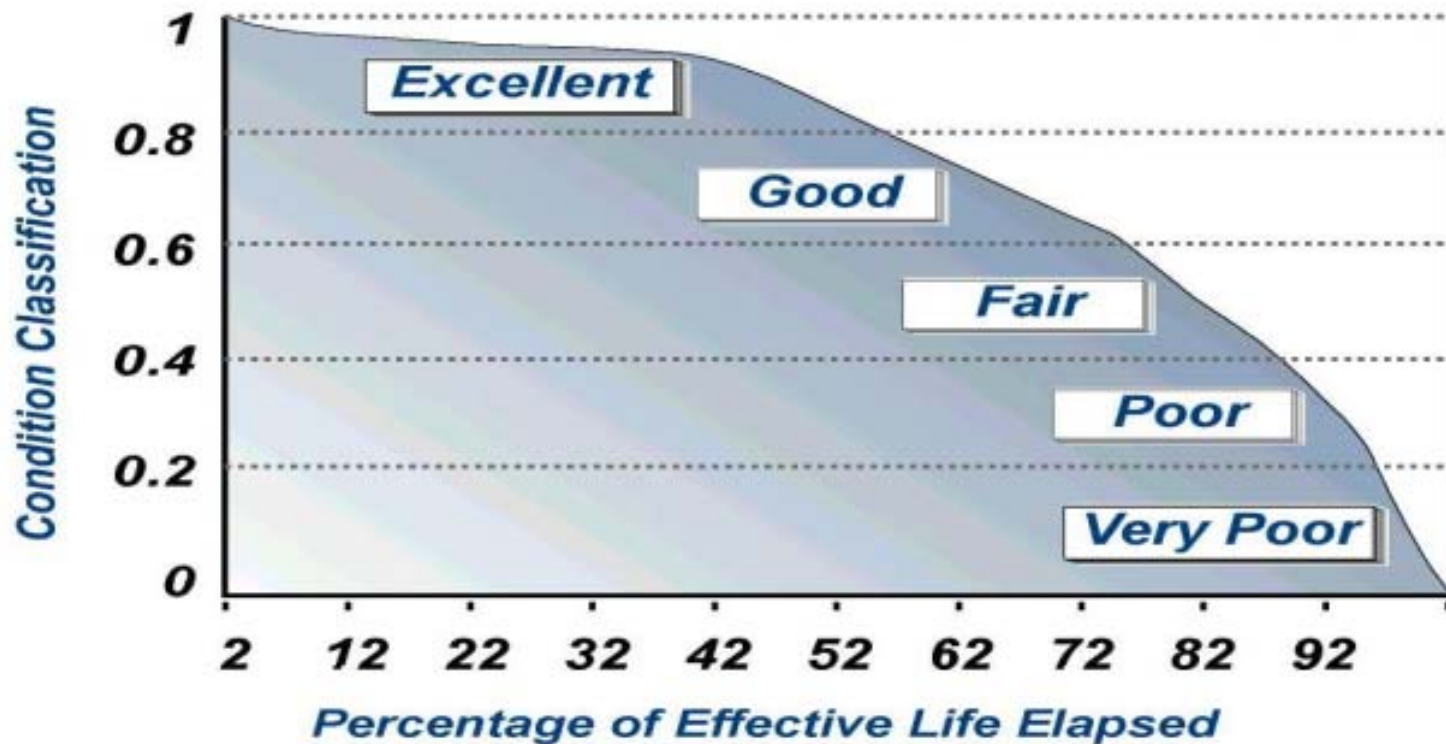
The Focus of This Discussion

Asset Management 101

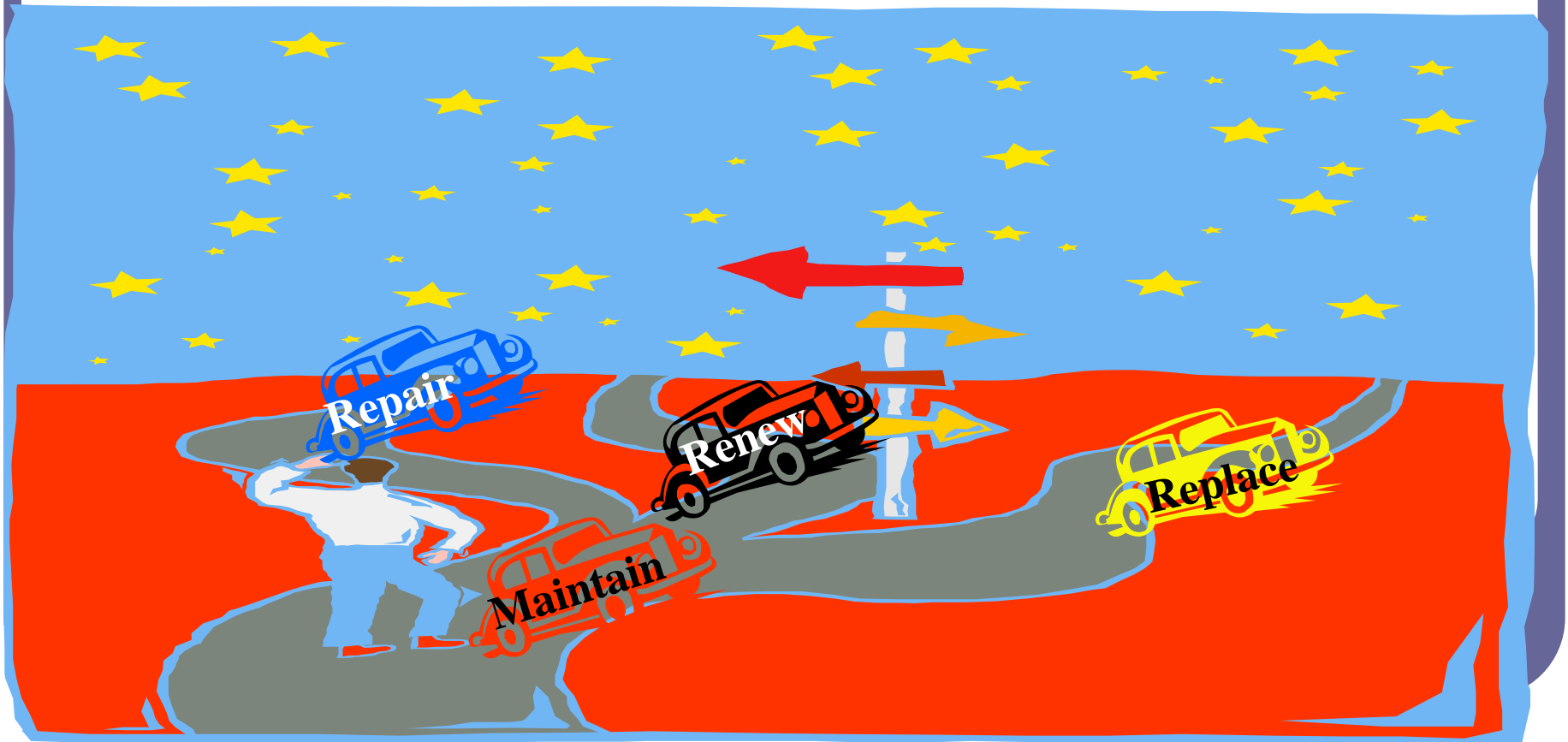
**All Physical Assets Deteriorate
and Eventually Fail...*Unless
they are properly maintained
and renewed or replaced***

Some Asset Deteriorate Quickly, Others Over Generations

*A projected deterioration pattern
for 100 year pipe*



The Heart of Managing a Successful Water or Wastewater Service - - Becoming Expert at Maintenance, Repair, Renewal or Replacement Decision Making



Asset Management Is A Critical Building Block In Bring About Sustainable Infrastructure

**better acquisition,
operations, maintenance, and
renewal and replacement
DECISIONS**

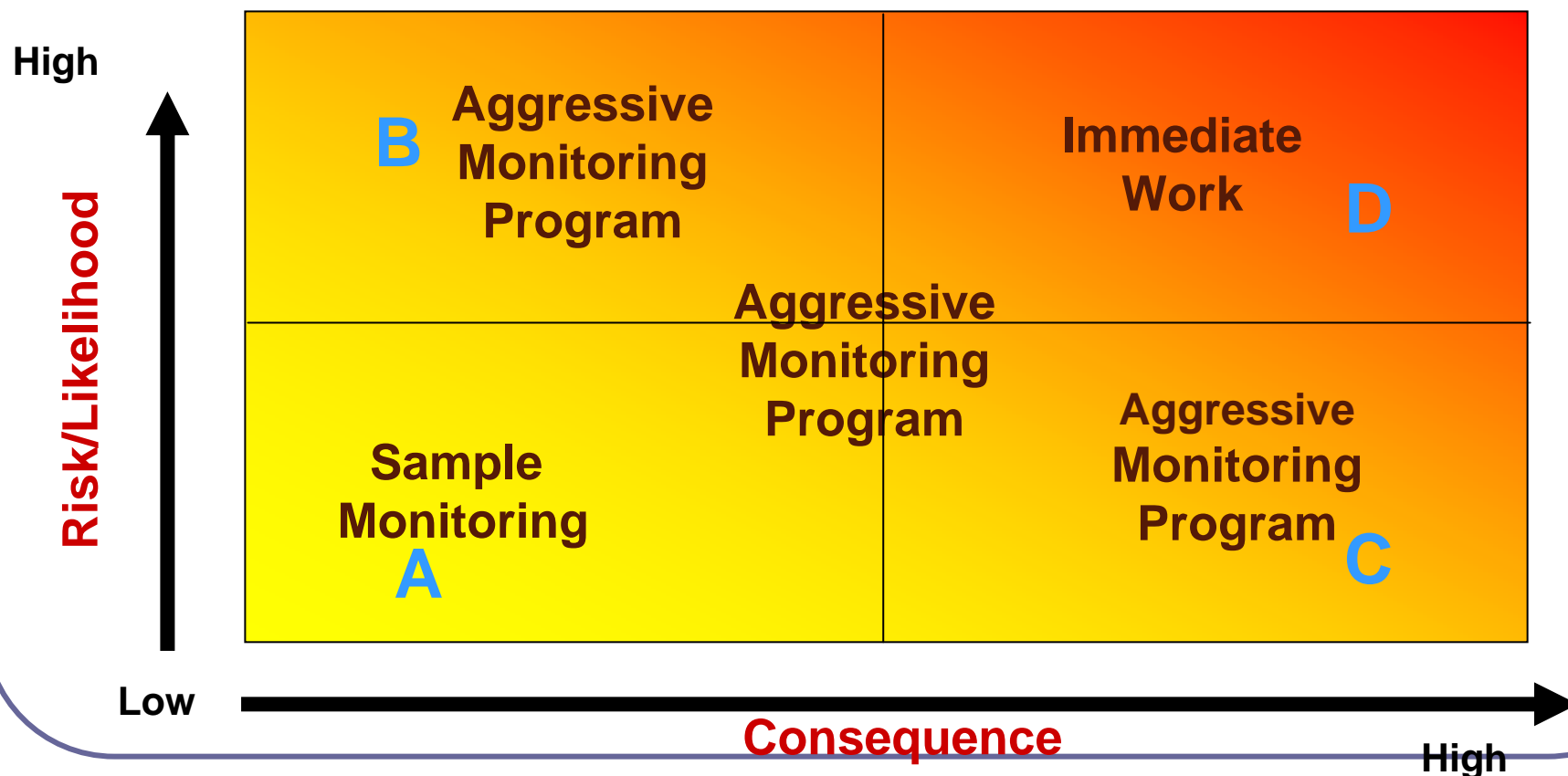
All Assets Are Not Created Equal!

(Criticality) is a function of
"Consequence" & "Likelihood" of Failure



What is the
likelihood of failure ? (risk)
&
What is the cost
of failure? (consequence)

Failure Risk/Consequence Should Drive The Work Program



The USEPA Asset Management Training Workshops Focus

Core Questions, Process & Life Cycle Cost



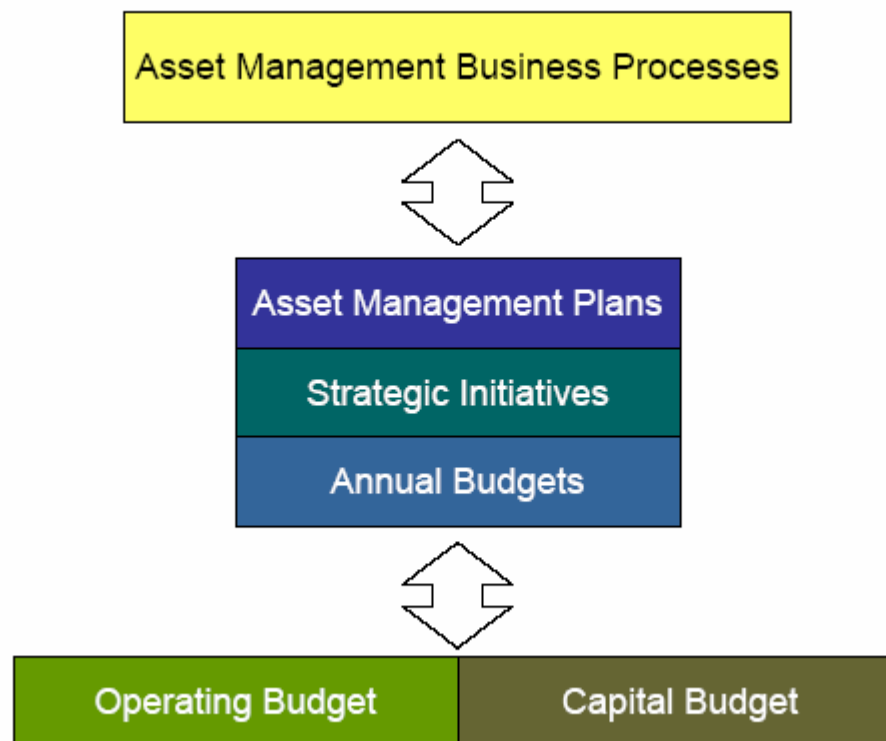
When Asset Management Is Examined It Can Be Explored From Any One of Several Perspectives

- The “Quality Elements”
- The “Management Framework”
- The “5 Core Management Questions”
- The “ 10 Core Processes and Practices”

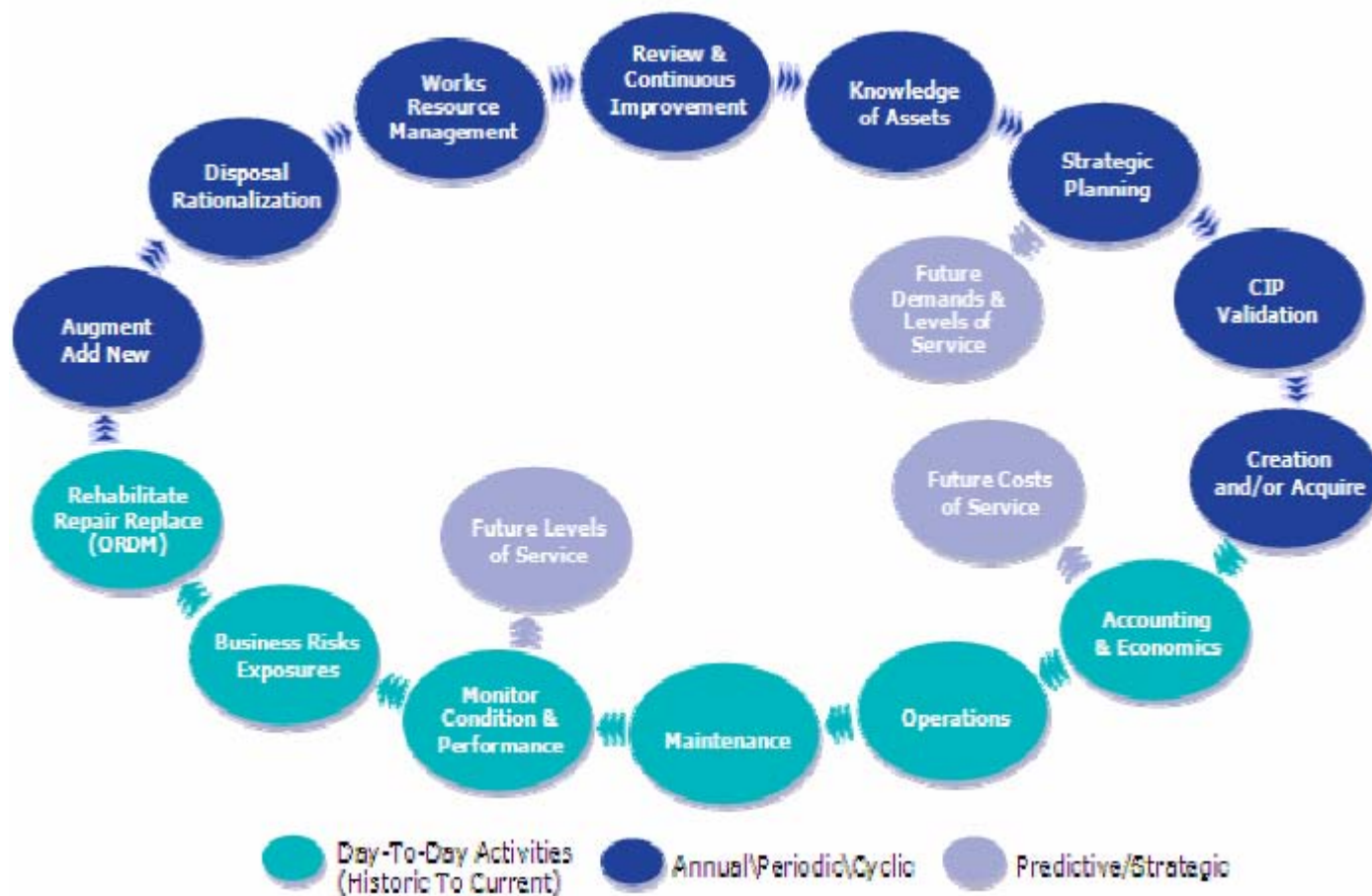
The “Quality Elements” View



The “Management Framework” Perspective

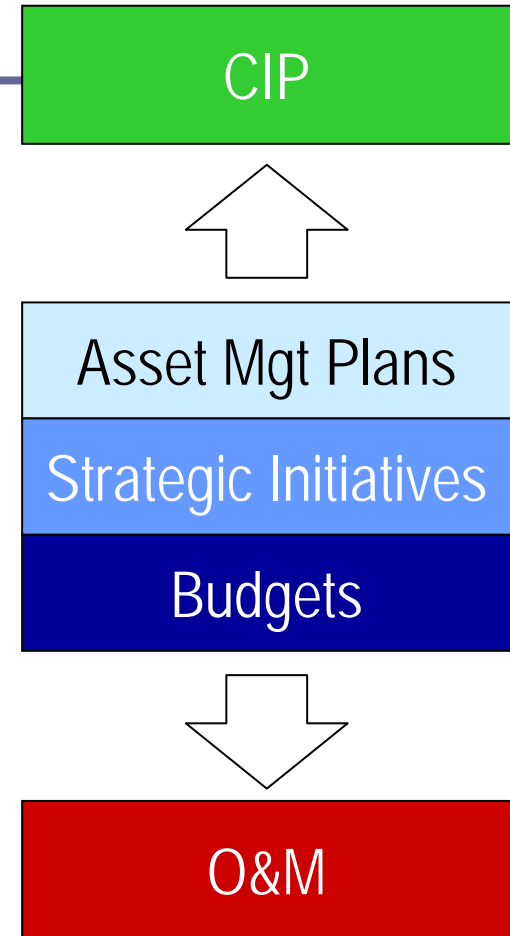
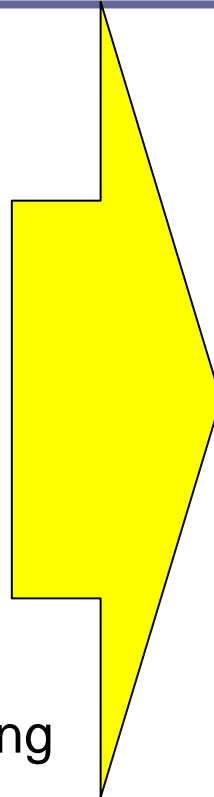


The Asset Life Cycle Viewpoint



AAM Has Fundamental “Building Blocks”. Improving the Detailed Knowledge Regarding The Building Blocks Greatly Informs The Management Processes

1. Definition
2. The asset life-cycle
3. How assets fail
4. Risk-consequence
5. Cost/valuation
6. Asset demand
7. Level of service
8. Business risk
9. Confidence in decision-making



Asset Management Core Questions?

- 1. What Is The Current State Of My Assets?**
- 2. What Is My Required “Sustainable” Level Of Service?**
- 3. Which Assets Are Critical To Sustained Performance Core**
- 4. What Are My Minimum “Life-cycle-cost” CIP and O&M Strategies?**
- 5. Given The Above, What Is My Best Long-term Funding Strategy?**

Problem Solving by Answering Core Questions

What is the current state of my assets?

- What do I own?
- Where is it?
- What condition is it in?
- What is its remaining useful life?
- What is its economic value?

What is my required sustained Level Of Service?

- What is the demand for my services by my stakeholders?
- What do regulators require?
- What is my actual performance?

Which assets are critical to sustained performance?

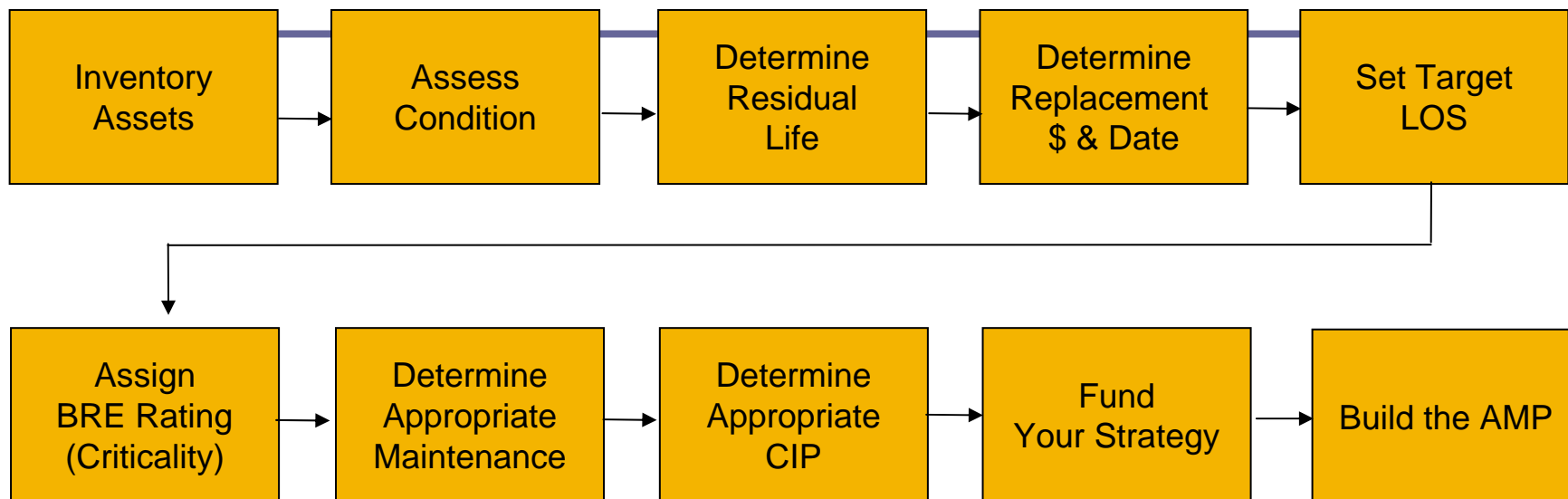
- How does it fail? How can it fail?
- What is the likelihood of failure?
- What does it cost to repair?
- What are the consequences of failure?

What are the best “life-cycle-cost” CIP and O&M strategies?

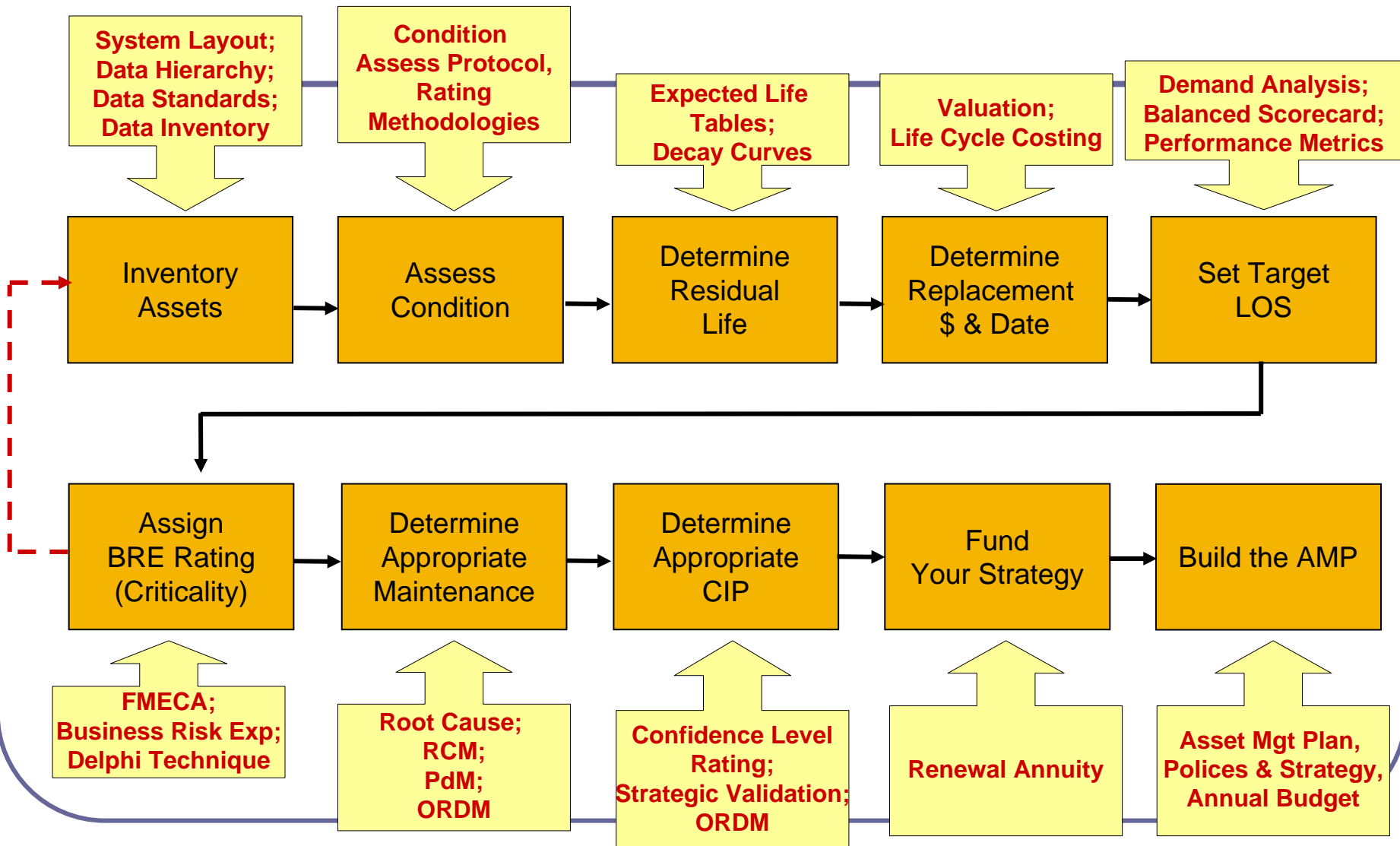
- What alternative management options exist?
- Which are most feasible for my organization?

Given the above, what is the best long-term funding strategy?

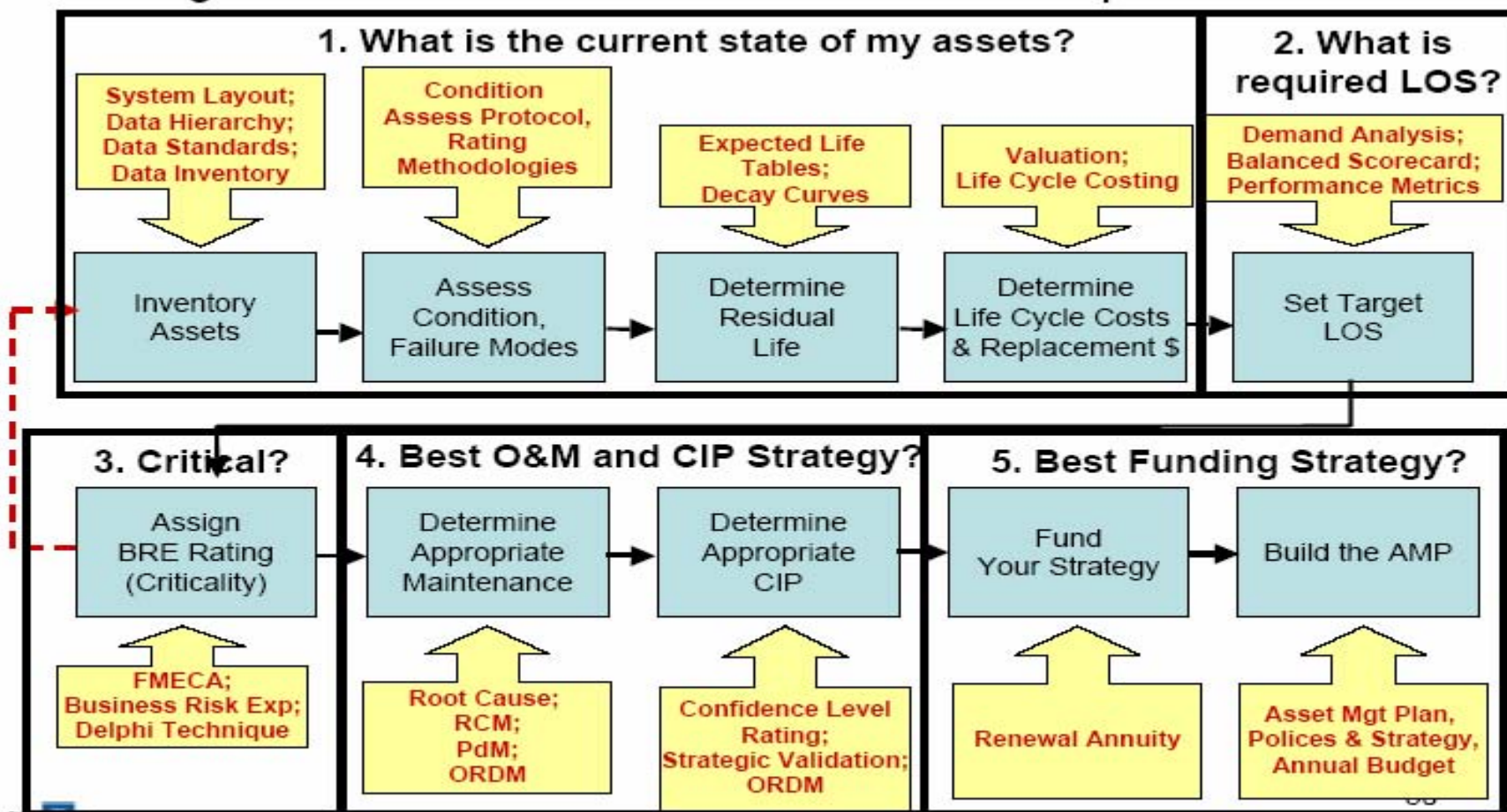
An Advanced Asset Management Program Process

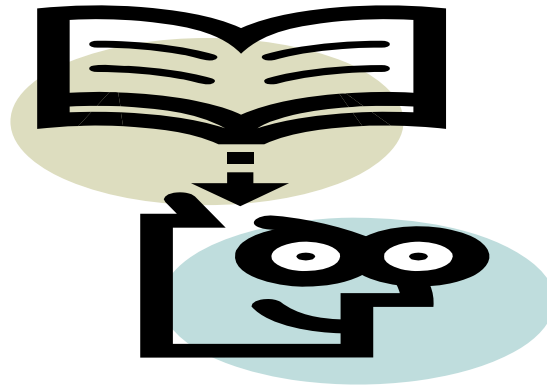


Core Process Steps & Related Tools



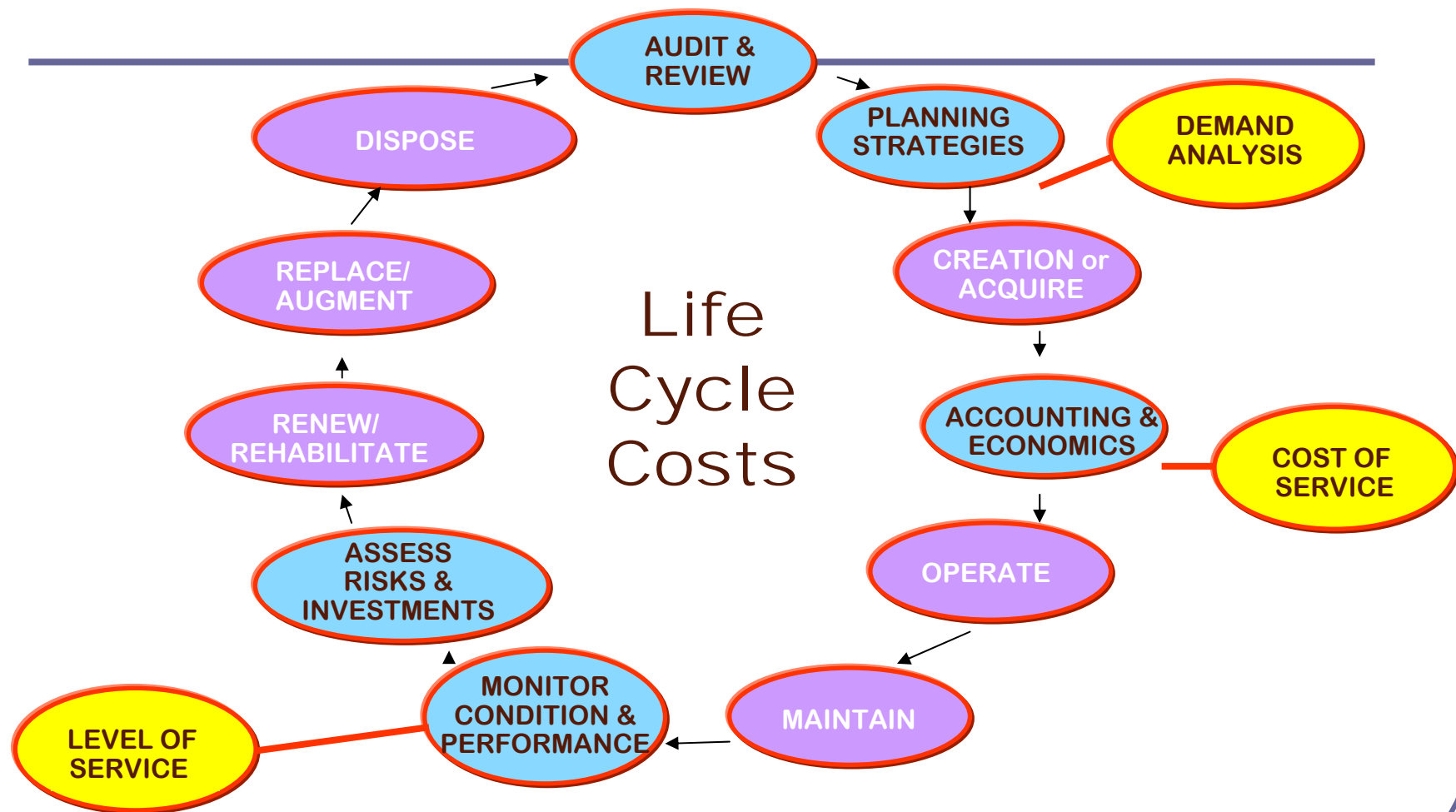
Relating The Five Core Questions To the "10 Step AMP Process"



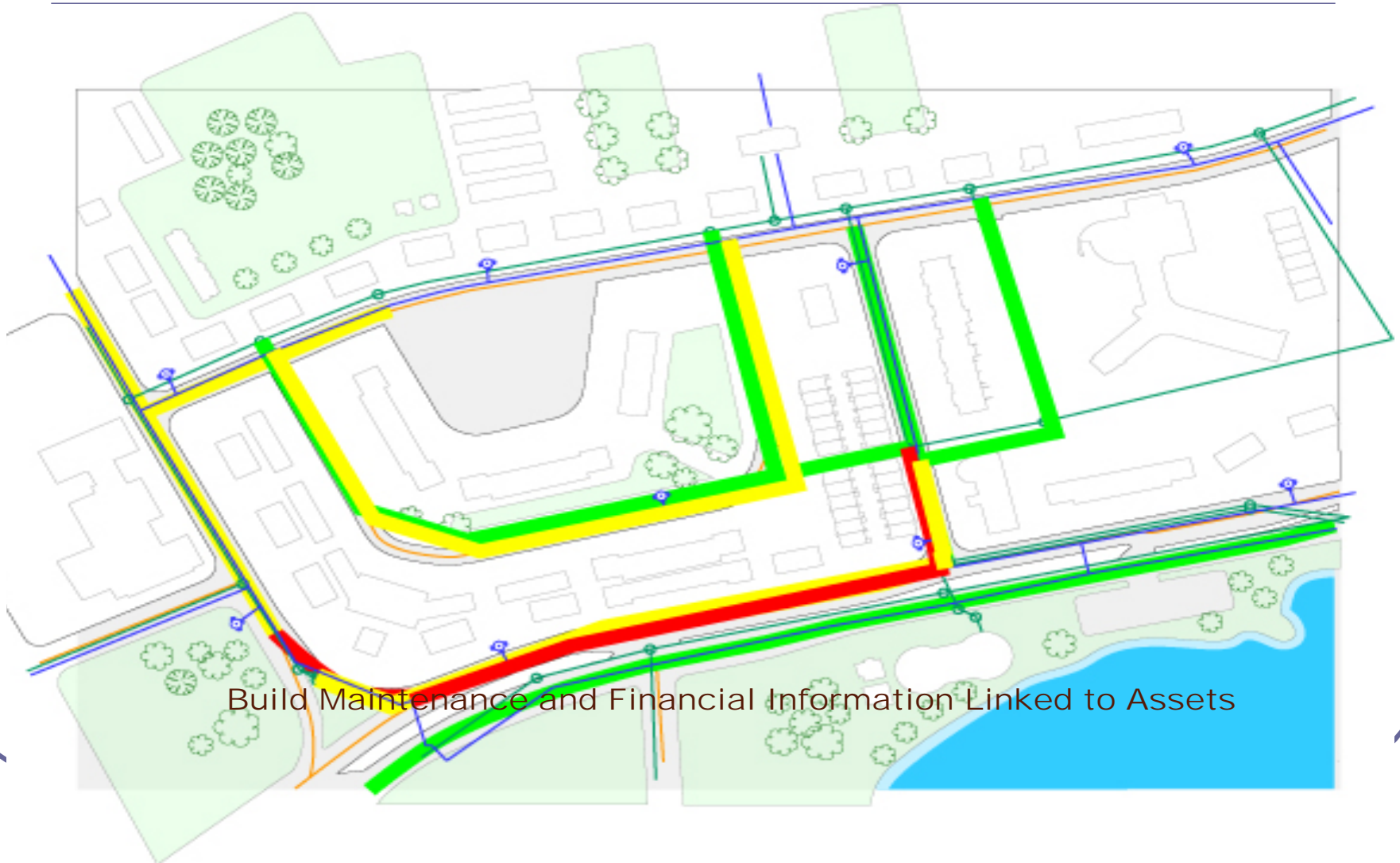


What I have Learnt:
Pay Major Attention
to the Fundamental

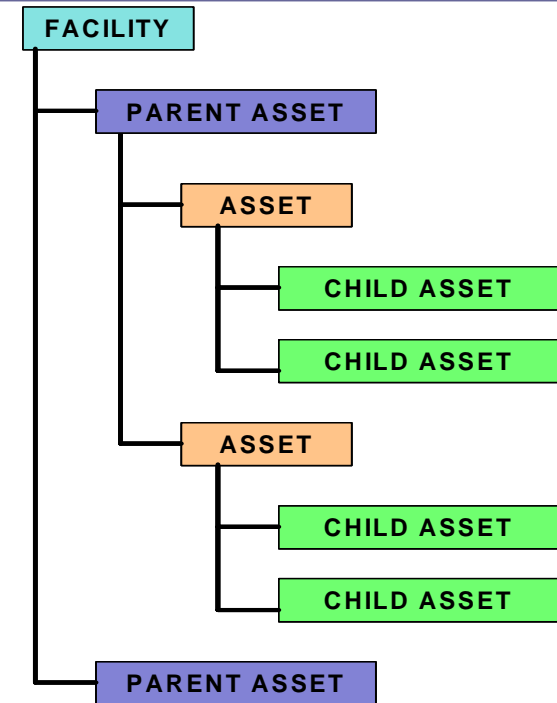
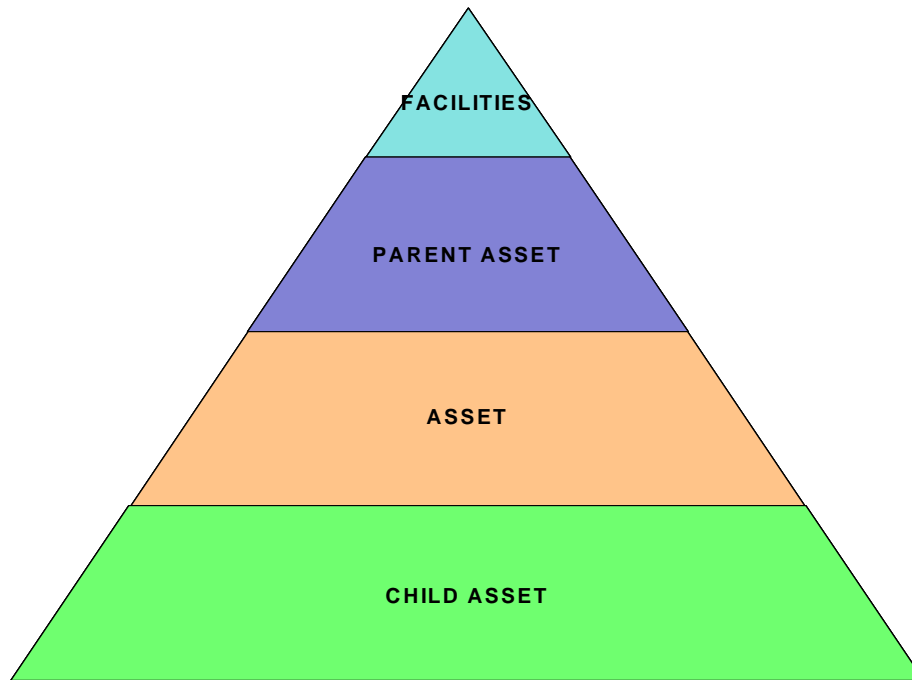
A Sustained Course of Action Requires a Complete and Transparent Understanding of the Full Liabilities



Determining the Current State of Your Assets Starts With Knowing What You Have!

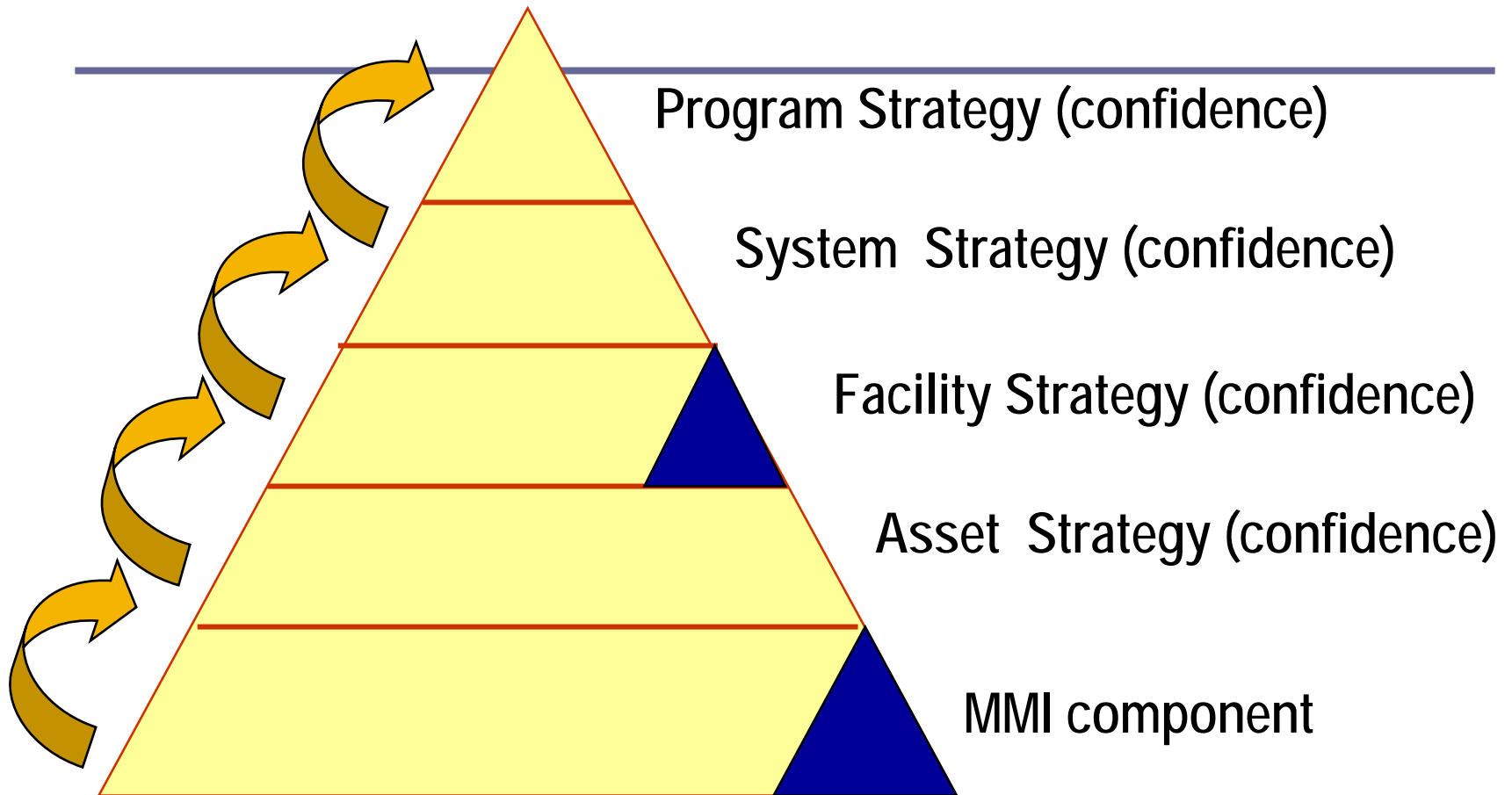


Data Standards and Asset Hierarchy are the Backbone of A Utilities Management Capabilities



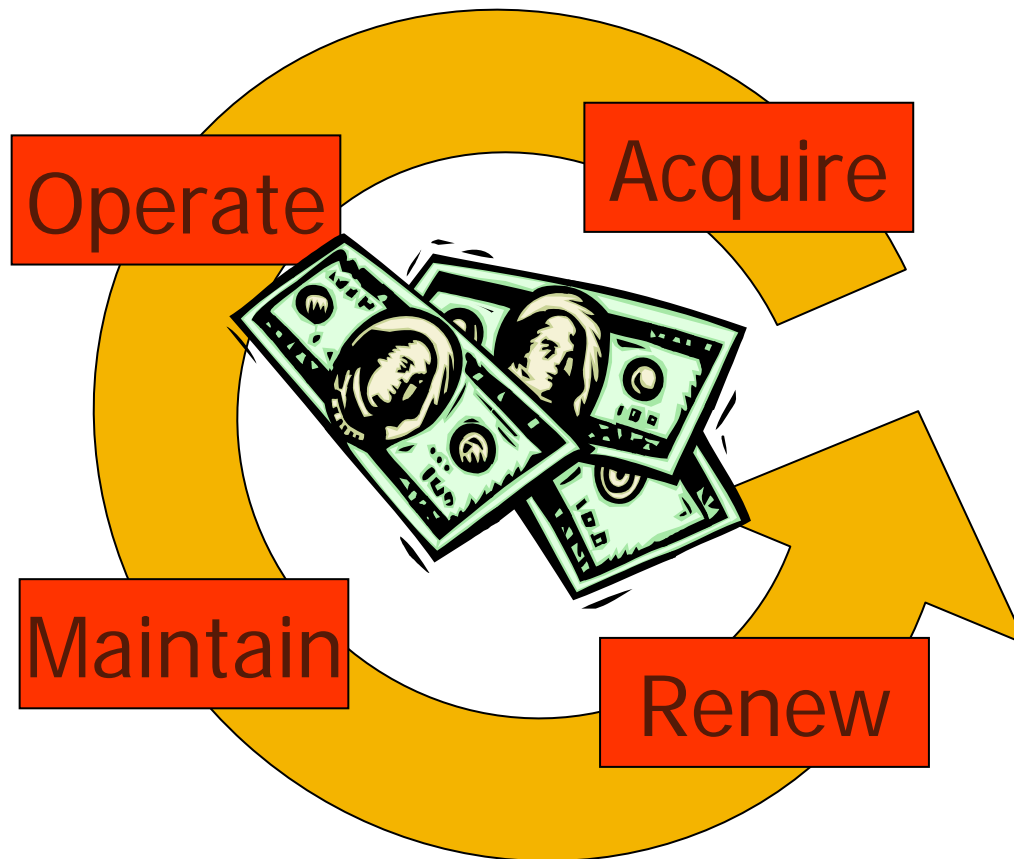
If organized knowledge does not exist on what we have, where it is, what condition it is in, and it's value, we can't possibly take the case that "It" is being managed.

Confidence In A Program Strategy Is A Function Of A Roll-Up



Confidence at higher system levels is determined by Managed Maintenance Item (MMI) component accuracy.

Least Cost Management of the Asset Is About Spending A Dollar At Right Time and On the Right Thing Over The Total Life Cycle Cost

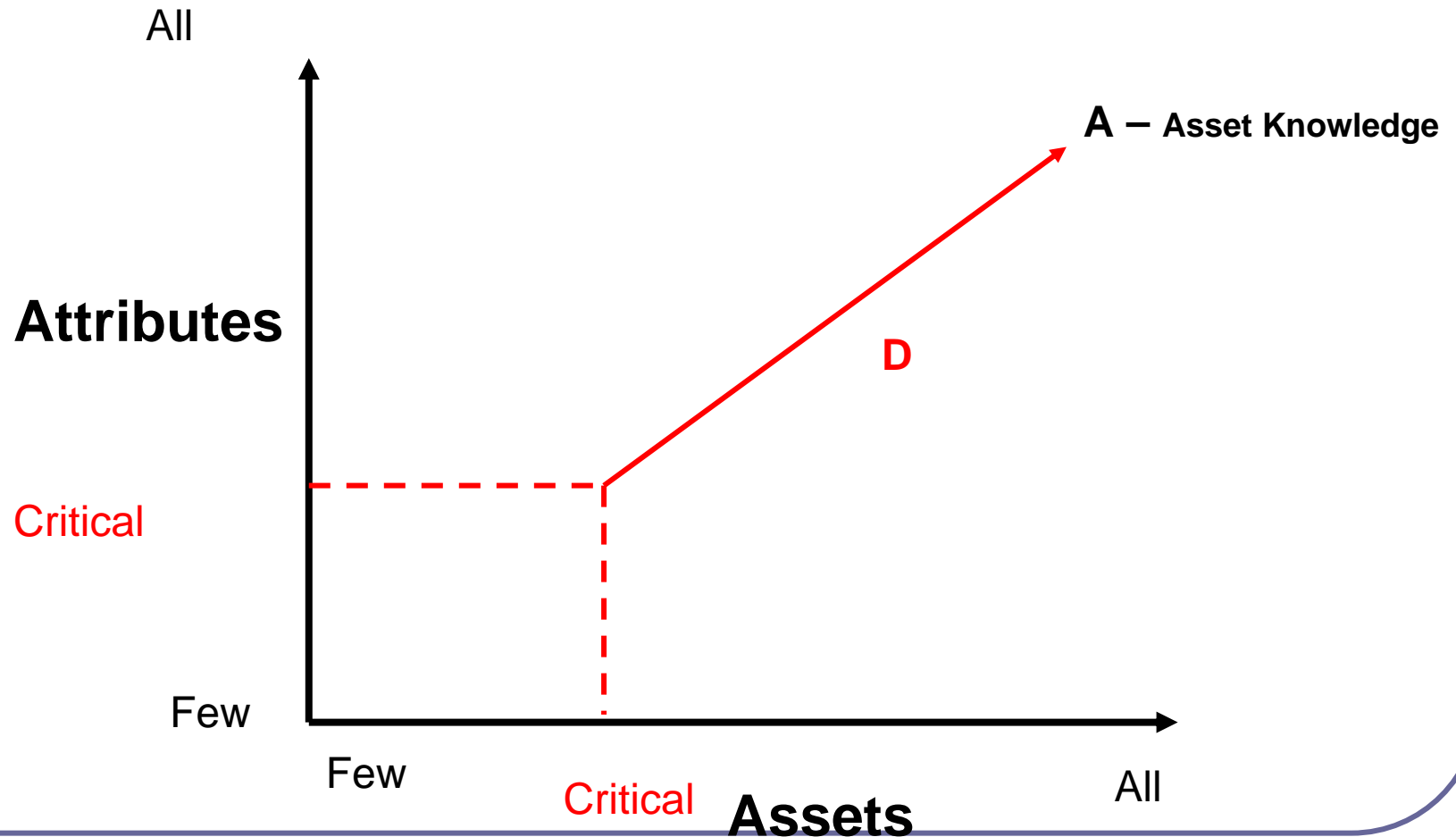


**“A Dollar Spent is A
Dollar Spent”**

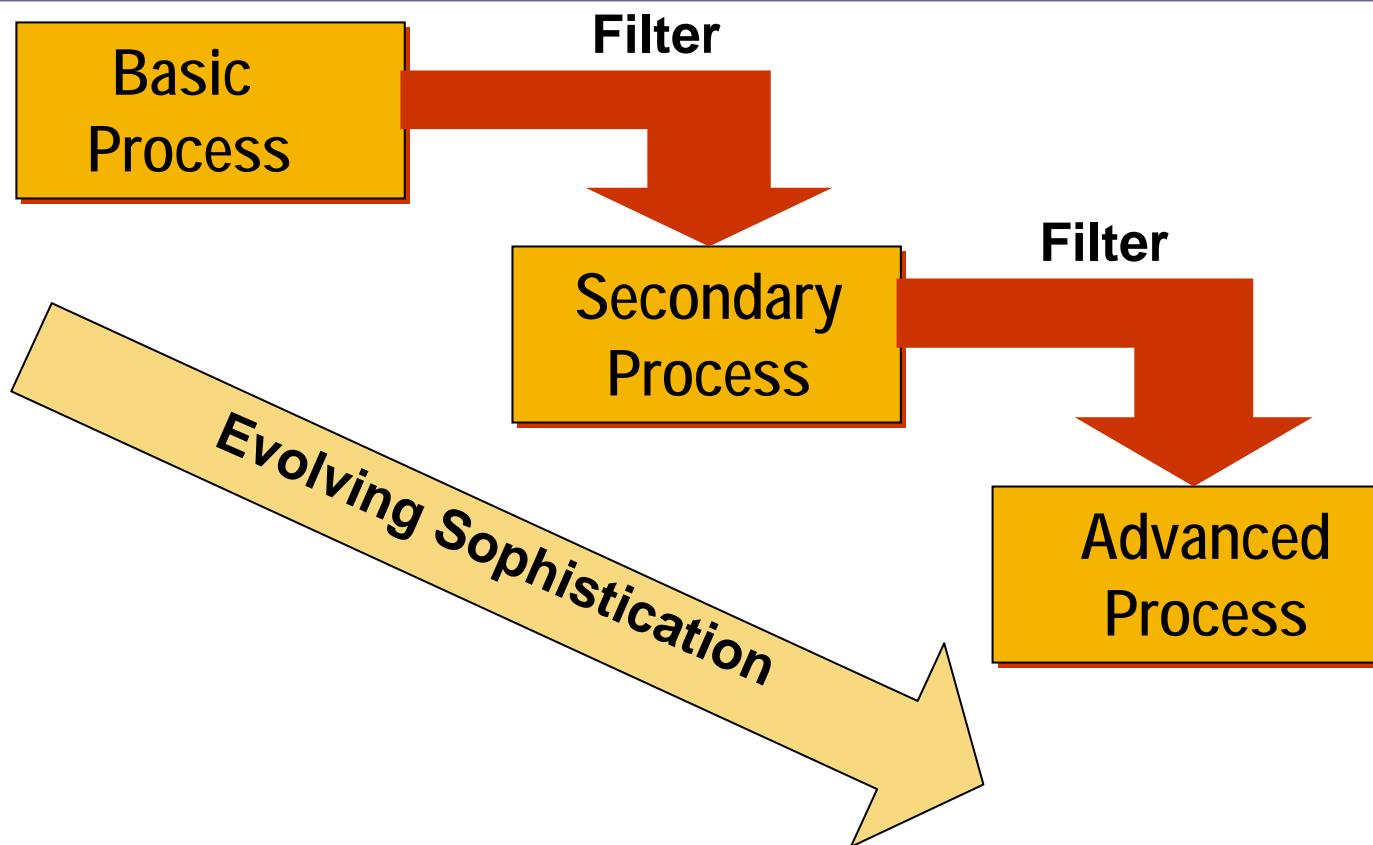
As A Sector We Have Failed To Adequately
Respect the Value of Quality Information!

**Best
Appropriate
Process** **+** **Quality of
Data Used** **=** **Confidence
That the
Course Is the
Right One!**

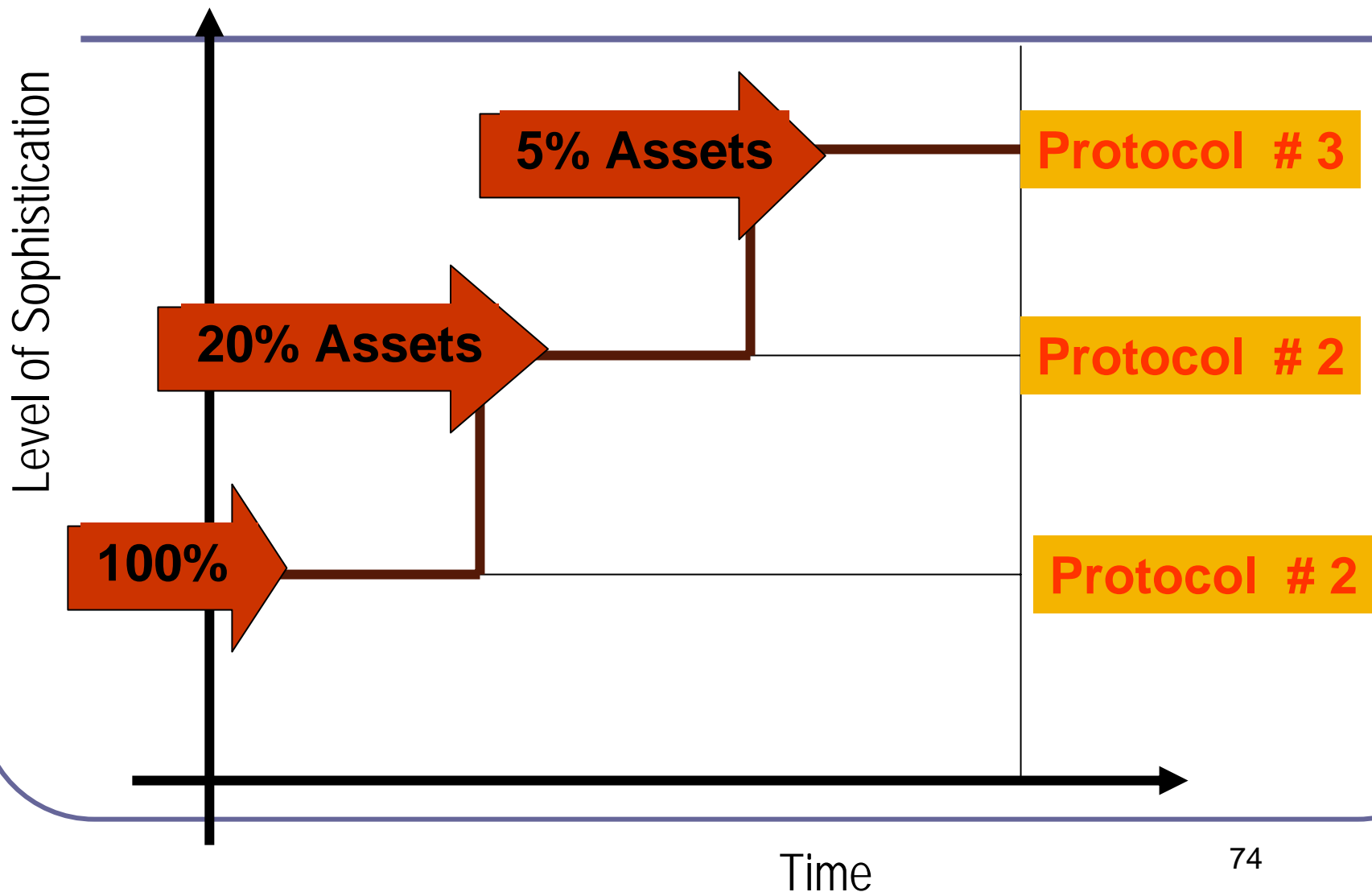
Effective Data Strategies Tie Back To Understanding What's Most Critical To the System



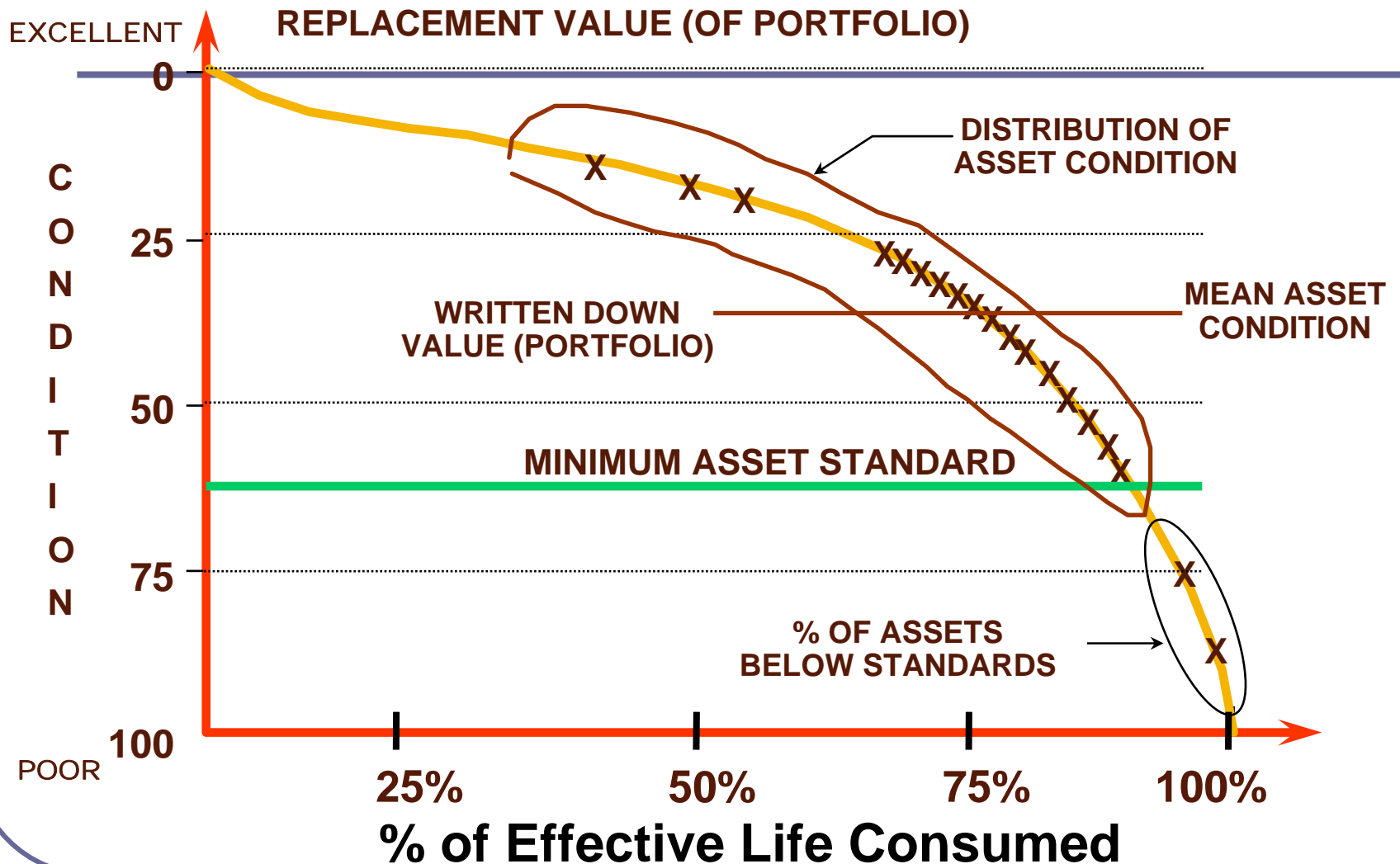
Everything Should Not Be Done With the Small Level of Emphasis – Use Filters To Focus Decision-Making



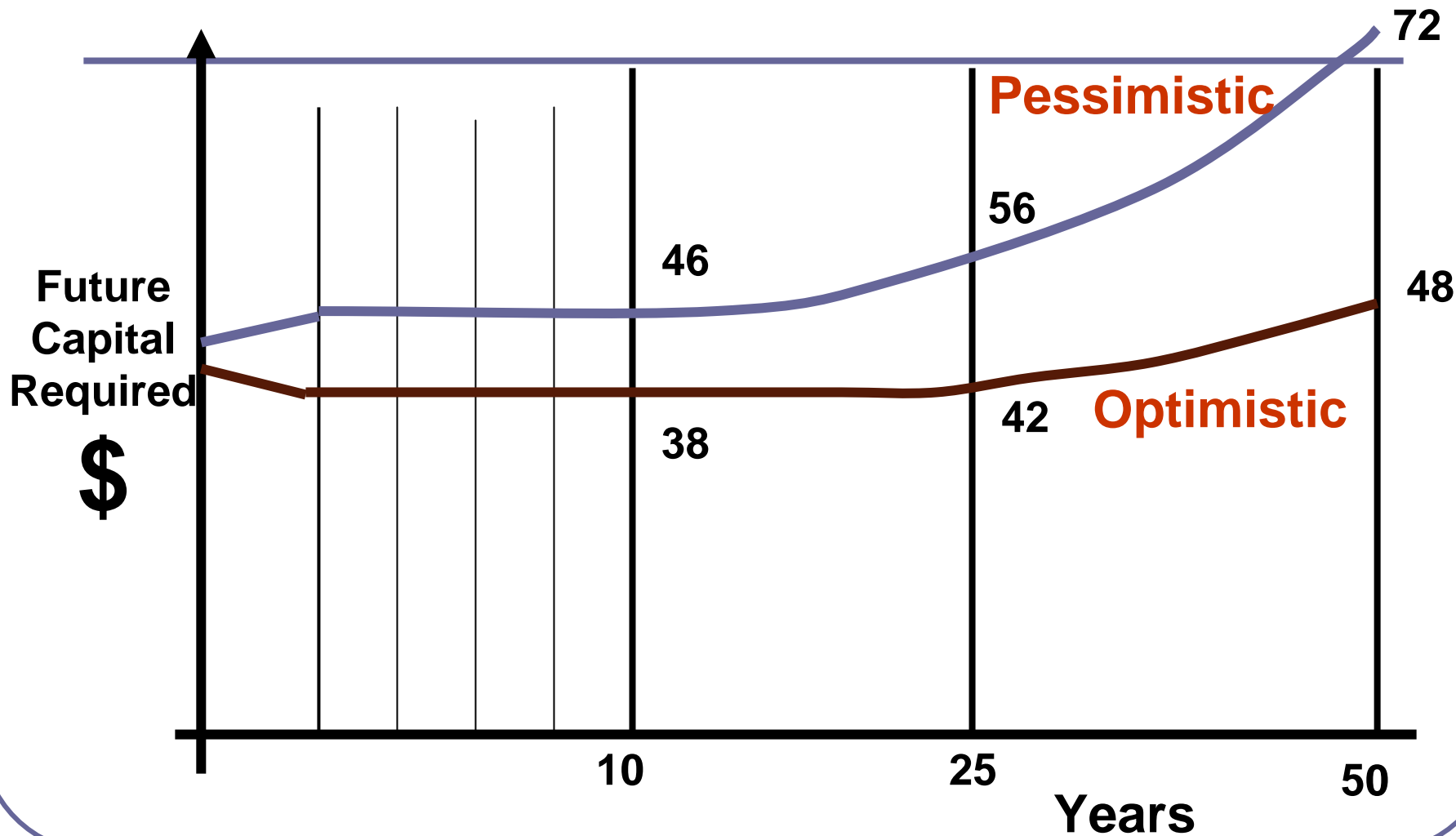
For Example: A Stepped Approach to Condition Assessment Protocols



Apply The “% of Effective Life Consumed” Concept To the Whole of The Portfolio Of Assets



Build An Envelope Around the Financial Picture



The Asset Management Challenge: Creating Cultural Change of Organizations



Asset Management Is Not Just For Engineering and O&M Anymore

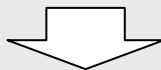


Asset investment decisions are based on the needs of the WHOLE organization and the Customer

Customer Service Demands



Sustained Performance



Executive Mgt

Asset Management Thinking

CIP

Finance

IT

Ops

Maint

Asset Management Tools

Breakdown
The Silos
With Asset
Centric
Thinking

Rolling the Ball Forward –

- A number of leading edge communities provide examples of how to take steps forward.
- SIMPLE
- NAMS
- The Collaborative Working Session
- WERF Condition Assessment Measures Matrices Project
- USEPA AAM workshops.

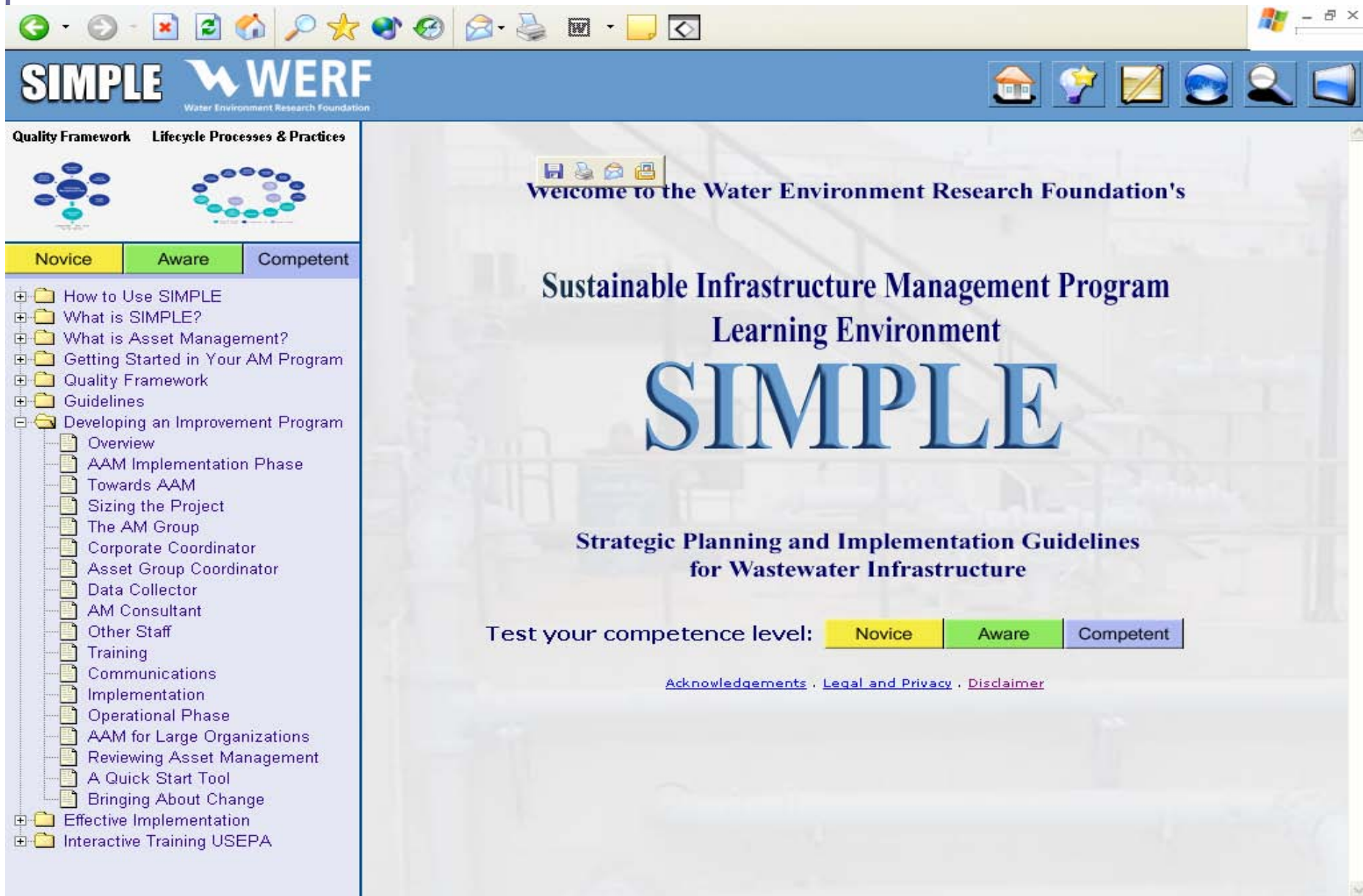


WERF's "SIMPLE" Project

"Sustainable Infrastructure
Management Program Learning Environment"

A Knowledge Management System

The Start-up Screen



The screenshot shows a web browser window displaying the SIMPLE WERF (Water Environment Research Foundation) website. The browser's address bar is empty, and the toolbar shows various icons for navigation and search. The website's header features the SIMPLE WERF logo and a navigation bar with icons for home, search, and other functions.

Quality Framework Lifecycle Processes & Practices

Novice Aware Competent

How to Use SIMPLE

- How to Use SIMPLE
- What is SIMPLE?
- What is Asset Management?
- Getting Started in Your AM Program
- Quality Framework
- Guidelines
- Developing an Improvement Program
 - Overview
 - AAM Implementation Phase
 - Towards AAM
 - Sizing the Project
 - The AM Group
 - Corporate Coordinator
 - Asset Group Coordinator
 - Data Collector
 - AM Consultant
 - Other Staff
 - Training
 - Communications
 - Implementation
 - Operational Phase
 - AAM for Large Organizations
 - Reviewing Asset Management
 - A Quick Start Tool
 - Bringing About Change
- Effective Implementation
- Interactive Training USEPA

Welcome to the Water Environment Research Foundation's

Sustainable Infrastructure Management Program

Learning Environment

SIMPLE

Strategic Planning and Implementation Guidelines

for Wastewater Infrastructure

Test your competence level: **Novice** **Aware** **Competent**

[Acknowledgements](#) . [Legal and Privacy](#) . [Disclaimer](#)

Level of User - Considered

SIMPLE - Microsoft Internet Explorer provided by GHD

File Edit View Favorites Tools Help Links external.ghd.com EPA- AM AMPLE Delta FedEx NEORSD PublicRadioFan 2Wire.com Home

Back Forward Stop Home Search Favorites Media Print Address y Documents\GHD Asset Management\Reference Materials\AM\SIMPLE\index.htm Go

Google Search PageRank 519 blocked ABC Check AutoLink AutoFill Options

SIMPLE WERF
Water Environment Research Foundation

Quality Framework Lifecycle Processes & Practices

Novice Aware Competent

- How to Use SIMPLE
- What is SIMPLE?
- What is Asset Management?
- Getting Started in Your AM Program
- Quality Framework
- Guidelines
- Developing an Improvement Program
- Effective Implementation
- Interactive Training USEPA
- SIMPLE Forum

SIMPLE Scorecard

Answer these questions to determine your entry level of asset management understanding to lead you through the SIMPLE site

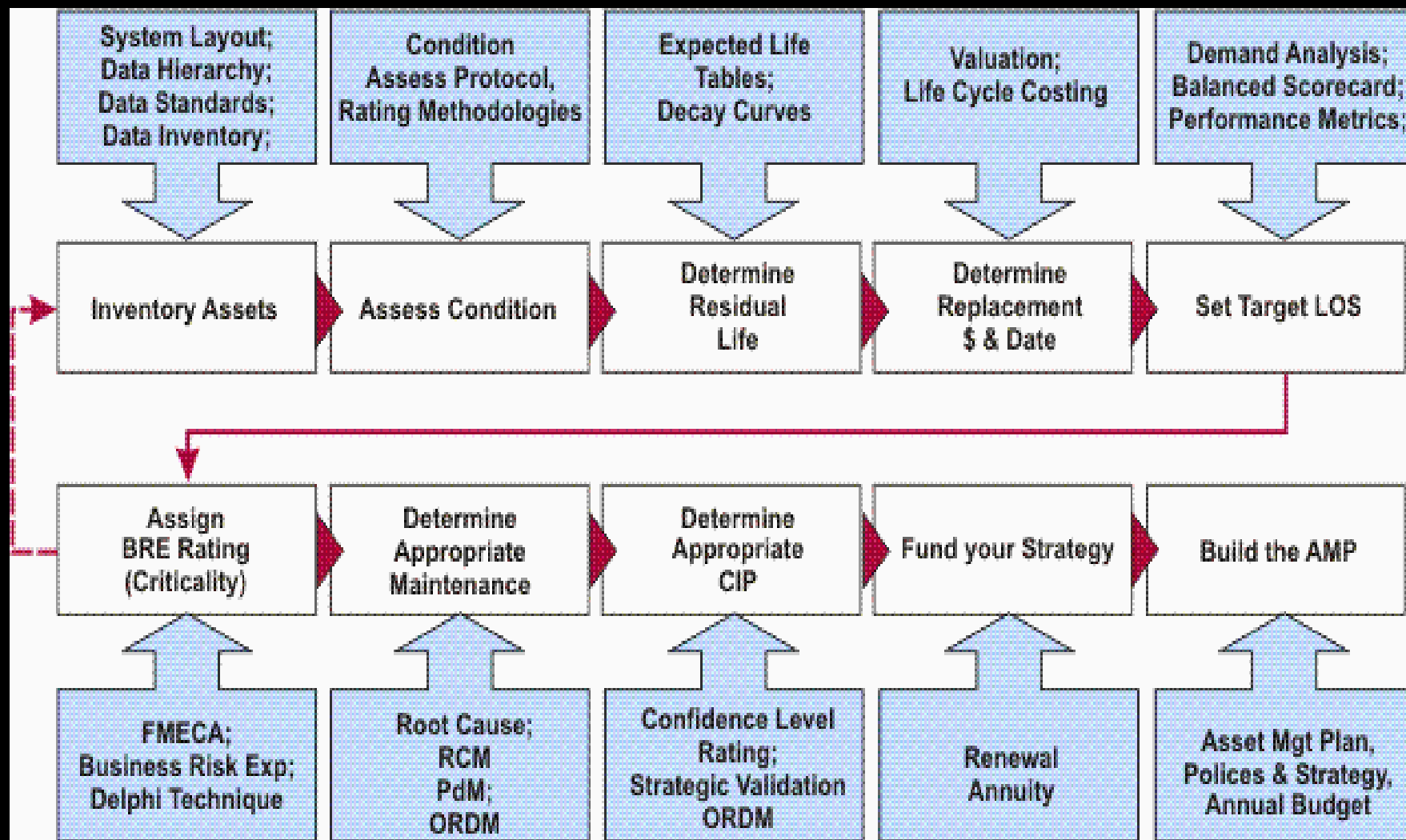
		Knowledge/Awareness					
Question	No/None	Little	Some	Average	Good	Excellent	
1. Have you read the International Infrastructure Management Manual?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
2. Have you attended any formal training in asset management?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3. Does your agency contain an electronic asset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Done My Computer

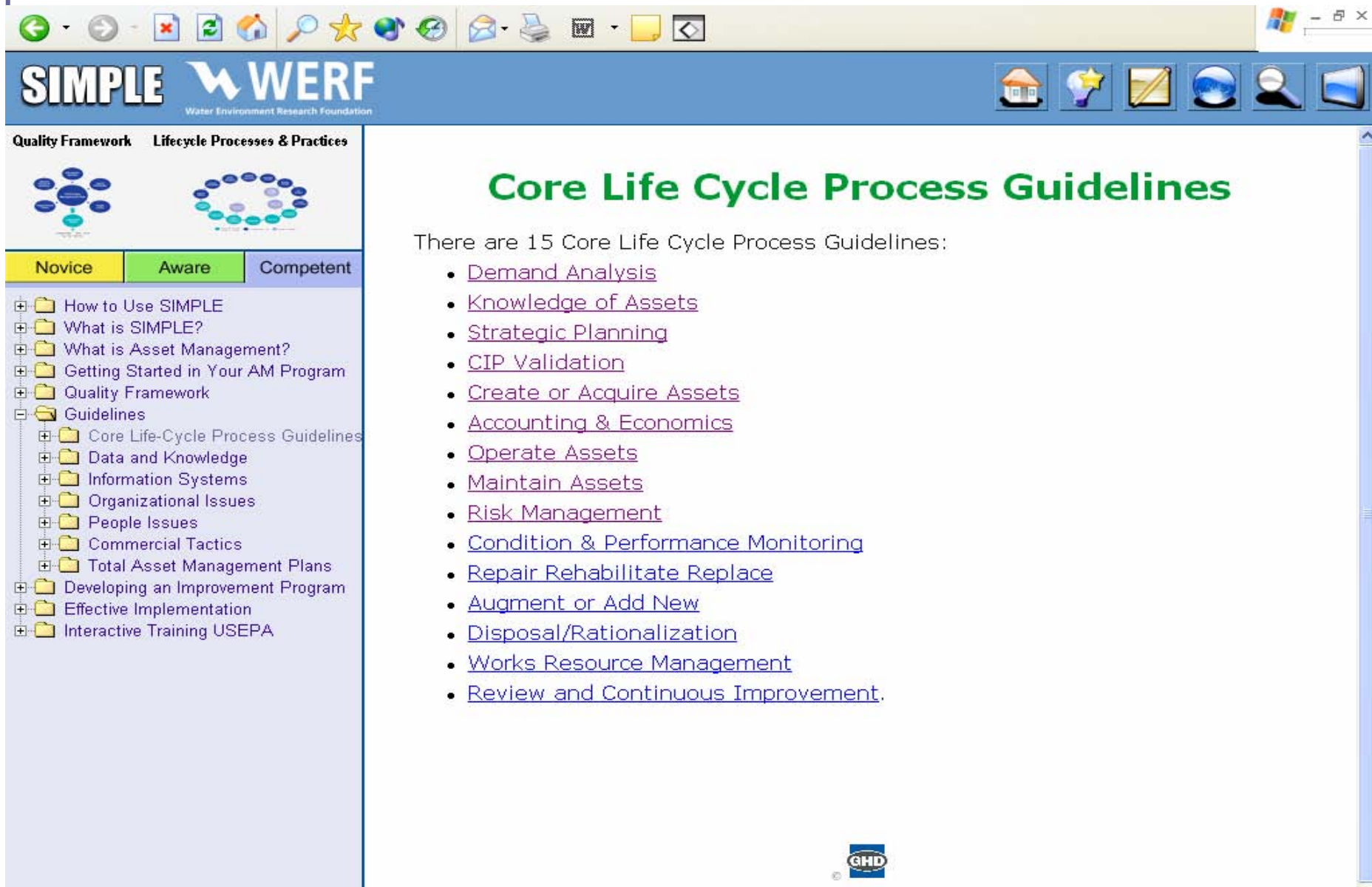
Start C:\Documents a... AMPLE/SIMPLE/... America Online ... My Yahoo! - Mic... SIMPLE - Mic... Microsoft Power...

2:41 PM

The "Core Processes and Practices" View Matches USEPA AAM Training



Core Life-Cycle Process Guidelines



The screenshot shows a web browser window displaying the SIMPLE WERF (Water Environment Research Foundation) website. The browser's address bar shows the URL "http://www.werf.org". The website has a blue header with the SIMPLE WERF logo and navigation icons. Below the header, there are two tabs: "Quality Framework" and "Lifecycle Processes & Practices". The "Lifecycle Processes & Practices" tab is active, showing a diagram of the lifecycle process. Below the diagram, there are three columns: "Novice", "Aware", and "Competent". The "Novice" column is highlighted, showing a list of topics including "How to Use SIMPLE", "What is SIMPLE?", "What is Asset Management?", "Getting Started in Your AM Program", "Quality Framework", "Guidelines", "Core Life-Cycle Process Guidelines", "Data and Knowledge", "Information Systems", "Organizational Issues", "People Issues", "Commercial Tactics", "Total Asset Management Plans", "Developing an Improvement Program", "Effective Implementation", and "Interactive Training USEPA". The "Core Life-Cycle Process Guidelines" topic is expanded, showing a list of 15 guidelines. The "Aware" column is also visible, showing a list of topics including "How to Use SIMPLE", "What is SIMPLE?", "What is Asset Management?", "Getting Started in Your AM Program", "Quality Framework", "Guidelines", "Core Life-Cycle Process Guidelines", "Data and Knowledge", "Information Systems", "Organizational Issues", "People Issues", "Commercial Tactics", "Total Asset Management Plans", "Developing an Improvement Program", "Effective Implementation", and "Interactive Training USEPA". The "Competent" column is also visible, showing a list of topics including "How to Use SIMPLE", "What is SIMPLE?", "What is Asset Management?", "Getting Started in Your AM Program", "Quality Framework", "Guidelines", "Core Life-Cycle Process Guidelines", "Data and Knowledge", "Information Systems", "Organizational Issues", "People Issues", "Commercial Tactics", "Total Asset Management Plans", "Developing an Improvement Program", "Effective Implementation", and "Interactive Training USEPA".

SIMPLE WERF
Water Environment Research Foundation

Quality Framework Lifecycle Processes & Practices

Core Life Cycle Process Guidelines

There are 15 Core Life Cycle Process Guidelines:

- [Demand Analysis](#)
- [Knowledge of Assets](#)
- [Strategic Planning](#)
- [CIP Validation](#)
- [Create or Acquire Assets](#)
- [Accounting & Economics](#)
- [Operate Assets](#)
- [Maintain Assets](#)
- [Risk Management](#)
- [Condition & Performance Monitoring](#)
- [Repair Rehabilitate Replace](#)
- [Augment or Add New](#)
- [Disposal/Rationalization](#)
- [Works Resource Management](#)
- [Review and Continuous Improvement](#)

GHD

Web Links & Distance Learning Capabilities

SIMPLE - Microsoft Internet Explorer provided by GHD

File Edit View Favorites Tools Help Links external.ghd.com EPA- AM AMPLE Delta FedEx NEORSD PublicRadioFan 2Wire.com Home

Back Forward Stop Home Search Favorites Media Address C:\Documents and Settings\G... Go Google

SIMPLE WERF
Water Environment Research Foundation

Quality Framework Lifecycle Processes & Practices

Novice Aware Competent

Getting Started in Your AM Program
Quality Framework
Guidelines
Developing an Improvement Program
Effective Implementation
Interactive Training USEPA
Prologue
Five Core AM Questions
What is the state of my assets?
What do I own and where is it?
What is the condition and remain
What is the value of my assets?
What is my sustainable level of s
Which assets are critical to perf
What are my "Minimum LCC" str
Using AAM to drive O&M decisic
Using AAM to drive CIP
What is my long term funding str
The "Big Picture" view
Focus topic 1, developing and dep
Focus topic 2, meeting the IT ch
SIMPLE Forum

Asset Management Web Sites

This area has been designed to allow links to asset management sites to be incorporated into the SIMPLE tool. The sites below have been included as a starting point for providing awareness to asset management practitioners.

Please forward to ghdamsupport@ghd.com.au any other sites which you believe should be included. We'll make sure that your recommendations are included in the final product.

- [Water Environment Research Foundation](#)
- [WERF SIMPLE](#)
- [Environmental Protection Agency \(EPA\) US](#)
- [EPA \(US\) Asset Management Training](#)
- [GAP-EX - Web based gap analysis tool](#)
- [Asset Management Quarterly International \(AMIQ\)](#)
- [Institute of Asset Management UK](#)
- [American Water Works Association](#)
- [NASSCO - Standards for the Rehabilitation of Underground Utilities](#)
- [Water Environment Federation \(WEF\)](#)
- [Office of Water Services UK \(OFWAT\)](#)

Done My Computer

Start C:\Documents ... Duncan Rose - ... America Online ... My Yahoo! - Mi... SIMPLE - Mic... WERF SIMPLE ... 3:35 PM

Self-Assessment "Gap" Analysis

GAP-Ex - View Assessment - Microsoft Internet Explorer provided by GHD

File Edit View Favorites Tools Help

Links AMPLE Delta external.ghd.com FedEx Live365 NEORSD Music Sojourn GAP-Ex PublicRadioFan IPWEA Member Services 2Wire.com Home

Back Forward Stop Home Search Favorites Media Print Mail Address https://www.gap-ex.com/User/AssessmentView.aspx?Use Go

GAP-Ex

*Examine the situation
Expose the problems
Execute the improvements*

[home] [main menu] [help] | [change pass] [logout]

Processes & Practices

Information Systems

Data & Knowledge

Commercial Tactics

Organization Issues

People Issues

Asset Management Plans

1.01

1.02

1.03

1.04

1.05

1.06

1.07

1.08

1.09

1.10

1.11

1.12

Assessment Locked: Assessment can not be changed because the Report has been generated

1.05 Capital Expenditure Evaluation

Policy for the evaluation of capital expenditure projects. (eg. Does a corporate wide / uniform policy and clear process exist? Does it ensure a commercial / business like approach to this decision making? Does it define roles and responsibilities for key activities?)	0 1 2 3 4	<p>0 = None</p> <p>1 = Under development</p> <p>2 = Documented in some business areas</p> <p>3 = Documented & covering whole business</p> <p>4 = Documented & fully implemented across whole business</p>
Processes for categorizing the cause of expenditure. (eg. Are capital expenditure categorized into growth, renewal, regulations / levels of service and business efficiency investment categories?)	0 1 2 3 4 5	<p>0 = Little or no knowledge</p> <p>1 = Little knowledge & ad hoc processes</p> <p>2 = Good knowledge & ad hoc processes</p> <p>3 = Consistent processes & partially documented</p> <p>4 = Extensive knowledge & partially documented</p> <p>5 = Fully documented & externally audited</p>
Processes for linking the sophistication and extent of the evaluation processes to the level of expenditure and the risk it represents to the organisation. (eg. Are more extensive evaluation techniques used for larger investments and risks to the business?)	0 1 2 3 4 5	<p>0 = Little or no knowledge</p> <p>1 = Little knowledge & ad hoc processes</p> <p>2 = Good knowledge & ad hoc processes</p> <p>3 = Consistent processes & partially documented</p> <p>4 = Extensive knowledge & partially documented</p> <p>5 = Fully documented & externally audited</p>

Done Internet

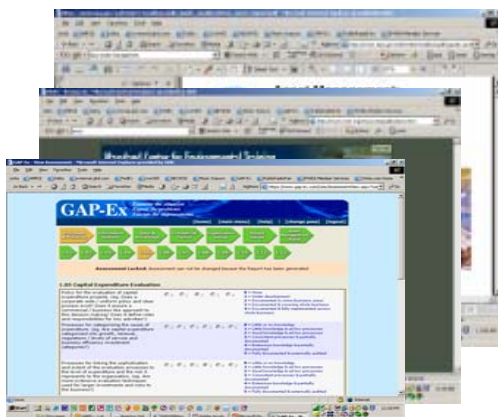
Start

C:\Documen... GAPEX - Lot... America Onli... GHDWEBAss... Adobe Acrob... Microsoft Po... GAP-Ex - Vi...

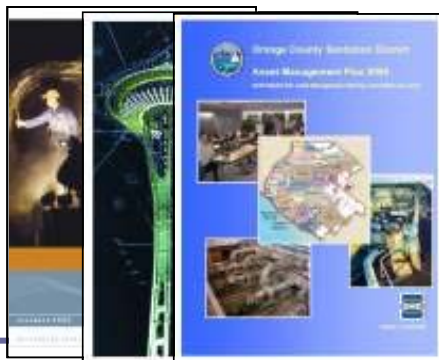
12:28 PM

Where to From Here?

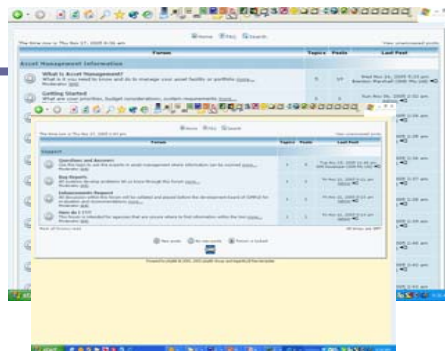
Tools



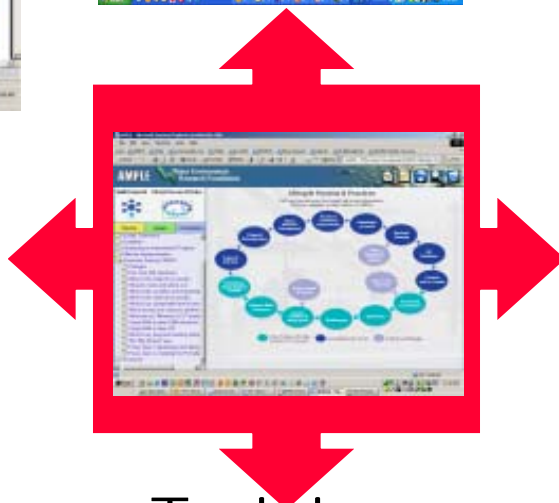
Examples/
Case Studies



Discussions

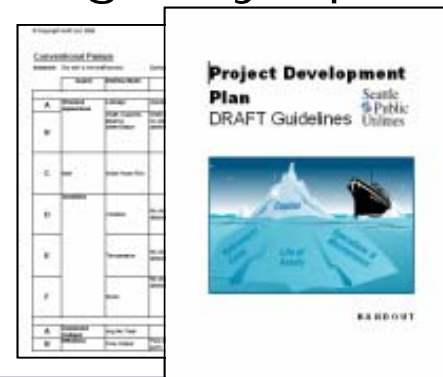


Research



Training
Accreditation
Qualifications

Agency Specific





TEAMS

**TOTAL
ELECTRONIC
ASSET MANAGEMENT
SYSTEM**

TEAMS

Open Source Asset Management Software for Small Communities



United States Environmental Protection Agency (USEPA)
Maryland Center for Environmental Training (MCET)
Delaware Environmental Training Center (DelTech)

Pilot Program

-
- The bottom line:
 - Pilot asset management program at four small- to medium-sized wastewater utilities in Maryland and Delaware
 - Develop “user friendly” software - TEAMS
 - Develop training curriculum for national distribution

What Does the Future Hold For Utilities?

It's All About Sustainability!

The Key Characteristics of Sustainable Utilities



Sustainable Systems Apply a Highly Developed Framework Of Existing Systems Strategies

- **Ecologically Sustainable Development**

Using, conserving and enhancing the community's resources so that ecological processes, so that the quality of life for both present and future generations is increased.

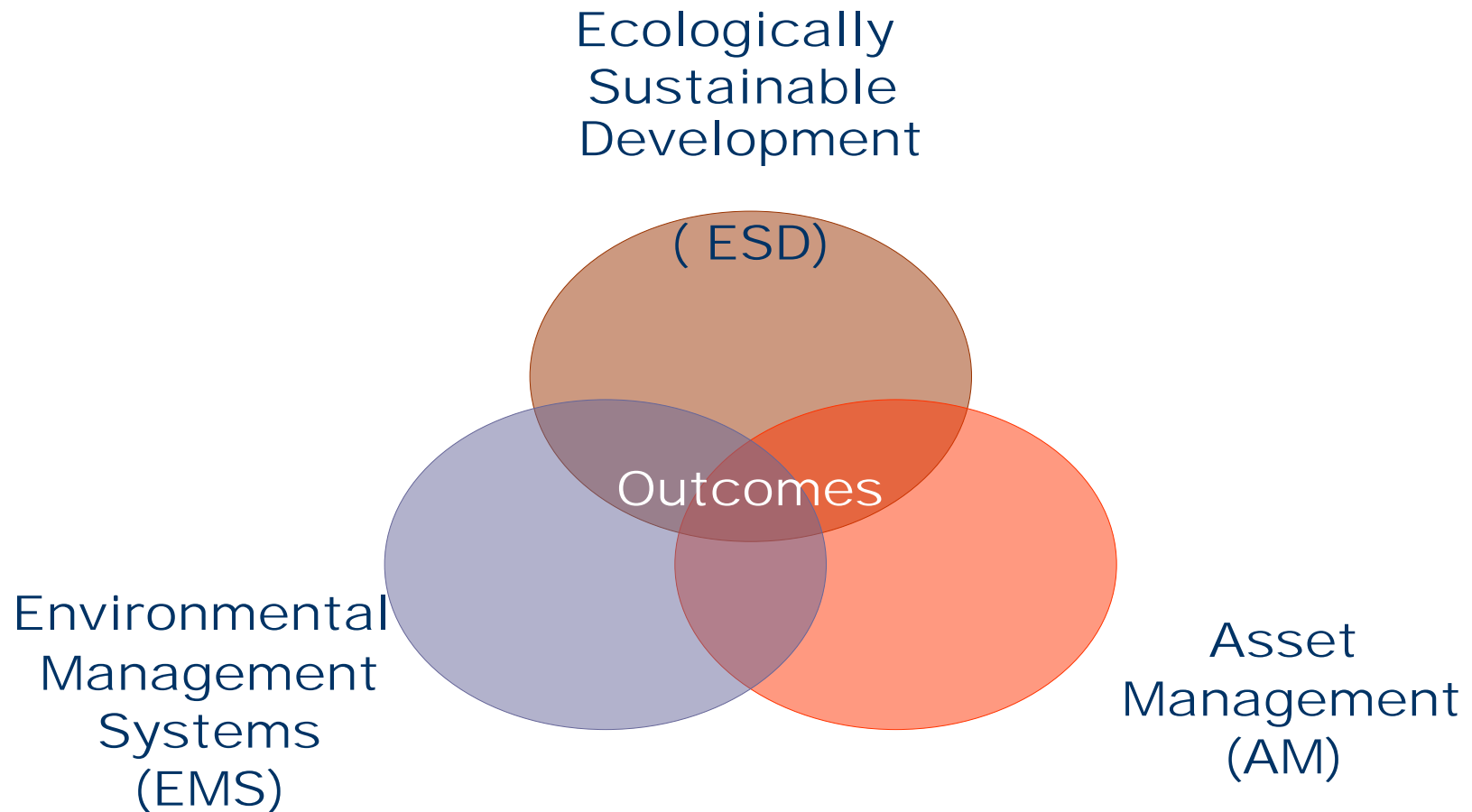
- **Environmental Management Systems**

A structured set of policies, procedures, and practices to reduce an organization's environmental "footprint". Often used to integrate other utility management programs

- **Strategic or Total Asset Management.**

Managing assets to minimize the cost of owning and operating them while continuously delivering the desired or required customer service.

The Holistic View Of Sustainable Management Systems

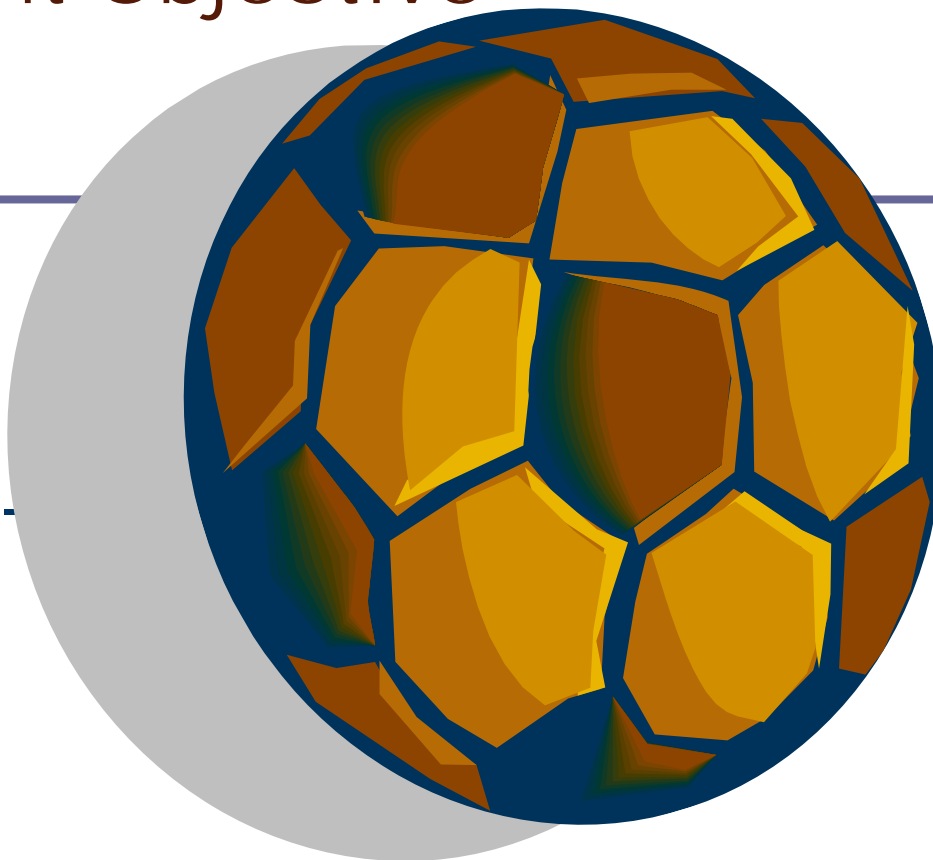


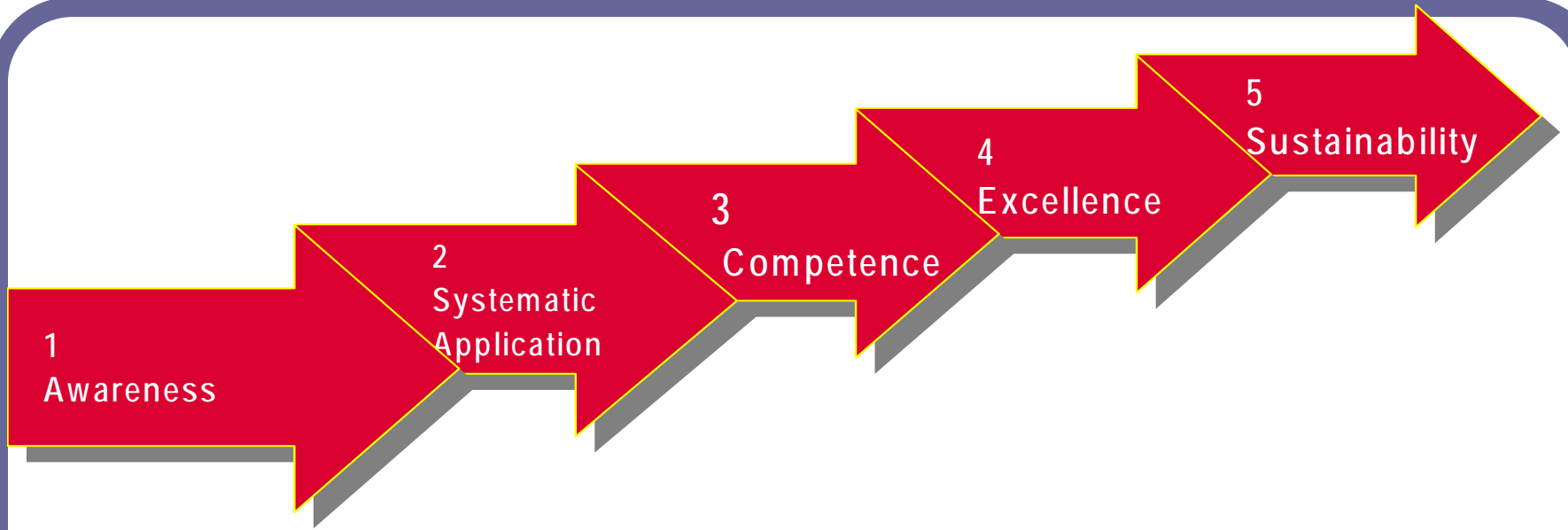
The Upcoming Focus - - Additional Skills Will Be Required to Become A Sustainable Business

The Focus Of Our Current Competencies



Current Objective





The Pathway to Success In AAM
Is Through Adoption
of The Framework and Structure



Our Objective Is To Help You
Develop Your Thinking About AAM
and Provide A Solid Foundation
For Taking Steps Forward In
Applying The Framework.
- - Have A Great Two Days - -